

Some Pectinoidea (Mollusca: Bivalvia: Propeamussiidae, Pectinidae) of the Red Sea

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Abstract

The report is based on a collection of 344 samples of pectinoids from the Red Sea and adjacent waters. Four species of Propeamussiidae and 18 species of Pectinidae were recognized. One pectinid taxon, *Mirapecten yaroni*, is undescribed. Three taxa are new pectinid records for the area: *Delectopecten musorstomi* Poutiers, 1981, *Glorichlamys quadrilirata* (Lischke, 1870), and *Mimachlamys andamanica* (Preston, 1908). *Gloripallium pallium* (Linnaeus, 1758) is recorded as living in the area for the first time. Lectotypes are designated for *Similipecten eous* (Melvill in Melvill & Standen, 1907) *Decatopecten flabelloides* (Reeve, 1852), *Coralichlamys madreporarum* (G.B. Sowerby 2nd., 1842) and *Semipallium crouchi* (Smith, 1892). Type localities of 20 taxa and the depository of type material for 19 taxa are given. All taxa are figured and extensive synonymy is presented. Intraspecific variation of most taxa is described. The total geographic distribution of each taxon is outlined. The following taxa may be endemic for the Erythrean subprovince: Propeamussiidae: *Parvamussium formosum* (Melvill in Melvill & Standen, 1907), *P. siebenrocki* (Sturany, 1901), and *P. thyrideum* (Melvill in Melvill & Standen, 1907); Pectinidae: *Pecten erythraeensis* G.B. Sowerby 2nd, 1842, *Gloripallium maculosum* (Forsskal, 1775), *Laevichlamys superficialis* (Forsskal, 1775). Two taxa: *L. superficilialis* (Forsskal, 1775) and *Mimachlamys senatoria* (Gmelin, 1791) are recorded from the Little Bitter Lake, Suez Canal. None of the taxa dealt with has migrated into the Mediterranean Sea.

Key words: Pectinoidea, Propeamussiidae, Pectinidae, taxonomy, zoogeography, Red Sea, NW Indian Ocean.

Introduction

The present paper is based on various collections of the families Propeamussiidae and Pectinidae from the Red Sea, the Gulf of Aden and a few samples from adjacent waters; most of the material originates from the Gulf of Aqaba.

Through the courtesy of the late professor Al. Barash a large collection of Pectinoidea, mainly kept at the Department of Zoology, Tel Aviv University, was entrusted to J. Knudsen for examination. Most of the material was identified, selected specimens photographed and a draft manuscript worked out. Following a visit of H.H. Dijkstra to the Zoological Museum, Copenhagen, it was decided that the latter should join the project and that the scope of the paper should be considerably extended. In addition numerous samples from H. Dijkstra's private collection were included.

The material comprises 4 taxa of Propeamussiidae and 18 taxa of Pectinidae, obtained at depths between 0 and 740 meters. It consists of material from the following collections:

- 1) Zoological Museum of the University of Tel Aviv: Samples registered prior to 1982 are marked NS; samples registered after 1982 are marked MO. This material was collected between 1966 and 1971. Samples marked ISRSE were collected in 1965 during the Israel South Red Sea Expedition.
- 2) Material kept at the Department of Zoology, The Hebrew University, Jerusalem (HUJ).
- 3) The private collection of H.H. Dijkstra (HD).
- 4) Zoological Museum, The University, Copenhagen (ZMUC).

In the sections "Material examined" the distinction between live-collected "live specimens", united (articulated) valves and separate valves has been made. By far the major part of the material consists of separate valves.

Type specimens (*) of the present species discussed are examined, or not seen (-).

Abbreviations

- AIM, Auckland Institute and Museum, Auckland
- AMS, Australian Museum, Sydney
- BMNH, The Natural History Museum, London
- HD, H.H. Dijkstra collection, Sneek, The Netherlands
- HUJ, Hebrew University of Jerusalem, Jerusalem
- IGPS, Institute of Geology and Palaeontology, Tohoku University, Sendai
- ISRSE, Israel South Red Sea Expedition (specimens in the ZMTAU)
- LSL, The Linnean Society of London, Burlington House, London
- MNHN, Muséum National d'Histoire Naturelle, Paris
- MNHNS, Museo Nacional de Historia Natural, Santiago
- MO, ZMTAU collection numbers after 1982
- NHMW, Naturhistorisches Museum Wien, Vienna
- NM, Natal Museum, Pietermaritzburg
- NMW, National Museum of Wales, Cardiff
- NNM, Nationaal Natuurhistorisch Museum, Leiden
- NS, ZMTAU collection numbers prior 1982
- TMAG, Tasmanian Museum and Art Gallery, Hobart
- UMZC, University Museum of Zoology, Cambridge, U.K.
- UUZM, Uppsala University Zoological Museum, Uppsala
- WPUR, Wilhelm Pieck Universität, Rostock
- ZMA, Zoological Museum, University of Amsterdam
- ZMB, Museum für Naturkunde, Humboldt-Universität, Berlin
- ZMUC, Zoological Museum, University of Copenhagen
- ZSI, Zoological Survey of India, New Alipur, Calcutta
- ZMTAU, Tel Aviv University, Tel Aviv
- D, diameter
- fr., fragment
- H, height
- L, length
- lv, left valve
- rv, right valve
- spm(s), an articulated specimen(s)
- stn., station
- v, valve

Systematics

Superfamily PECTINOIDEA Wilkes, 1810 [emend. Waller, 1978]

Family PROPEAMUSSIIDAE Abbott, 1954

Genus *Parvamussium* Sacco, 1897

Parvamussium Sacco, 1897a: 102.

Type species (by original designation): *Pecten (Pleuronectes) duodecimlamellatus* Bronn, 1832; Upper Miocene, northern Italy.

For synonymy, diagnosis, distribution and remarks see Dijkstra (1995: 25).

Parvamussium formosum (Melvill in Melvill & Standen, 1907)
(Plate 2, figs. 5-8)

**Amussium formosum* Melvill in Melvill & Standen, 1907: 807, pl. 55, figs. 7, 7a.

Propeamussium cf. *scitulum* (Smith).- Oliver, 1992: 70, 73, pl. 12, fig. 4, text-fig. 5.

Parvamussium formosum.- Rombouts, 1991: 67.

Type material: Two syntypes (2 rv) BMNH 1907.5.3.50, 26 syntypes NMW 1955.158.674. Several syntypes deposited in other museums (Dijkstra, personal observation).

Type locality: Persian Gulf, Gulf of Oman, 24°58'N, 56°54'E, 156 fathoms [= 285 m].

Material examined: The type material. RED SEA: Opposite Elat, 180m, 4 v, 6.ix.1966, MO 28451; Opposite Elat, 180m, 1 v, 6.ix.1966, MO 28472; Opposite Elat, 180-200m, 20 v, 6.ix.1966, MO 28461; Opposite Elat, 180-200m, 2 v, 6.ix.1966, MO 28452; Elat, opposite Marine Lab., 400-450m, 1 v, 6.ix.1966, MO 28473; Elat, opposite Marine Lab., 215m, 5 v, 6.ix.1966, MO 28470; Opposite Elat, 80m, 4 v, 7.ix.1966, MO 28475; Opposite Elat, 62-80m, 7 v, 7.ix.1966, MO 28467; off Gerivat Farun, 50m, 2 v, 21.viii.1968, MO 28448; Elat, opposite Old Port, 121m, 20 v, 10.ix.1968, MO 28460; Elat, opposite Old Port, 121m, 15 v, 10.ix.1968, MO 28462; Elat, opposite New Port, 220m, 15 v, 16.ix.1968, MO 28454; Elat, opposite New Port, 220m, 3 v, 16.ix.1968, MO 28453; Elat, opposite Zarhin Plant., 167m, ca. 140 v, 16.ix.1968, MO 28449; Elat, opposite Zarhin Plant., 167m, ca. 125 v, 16.ix.1968, MO 28450; Elat, opposite Zarhin Plant., 167m, 2 v, 16.ix.1968, MO 28447; off Mersat Abu Samra, 55m, 1 v, 6.x.1969, MO 28469; off Mersat Abu Samra, 50m, 2 v, 6.x.1969, MO 28471; off Mersat Abu Samra, 140m, 67 v, 6.x.1969, MO 28459; off Murach, 91m, 2 v, 6.x.1969, MO 28463; off Nuweiba el Tarabin, 137-146m, ca. 1000 v, 8.x.1969, MO 28537; off Nuweiba el Tarabin, 150m, 1 v, 8.x.1969, MO 28477; off Nuweiba el Museina, 330-400m, 1 v (fragment), 8.x.1969, MO 28457; off Nuweiba el Museina, 274-300m, 3 v, 8.x.1969, MO 28456; off Wadi Murach, 80m, 1 v, 9.x.1969, MO 28445; off Elat, 242m, 10 v, 17.xi.1969, MO 28446; Elat, opposite Electric Plant., 320m, 2 v, 9.ii.1970, MO 28464; Elat, opposite Electric Plant., 320m, 1 v, 9.ii.1970, MO 28476; Elat, opposite Marine Lab., 600m, 2 v, 9.ii.1970, MO 28468; Elat, opposite New Port, 270m, 45 v, 13.ii.1970, MO 28465; Elat, opposite New Port, 170-270m, 19 v, 13.ii.1970, MO 28458; Elat, opposite New Port, 170-270m, 18 v, 13.ii.1970, MO 28466; Elat, opposite New Port, 270m,

10 v, 13.ii.1970, MO 28444; Elat, opposite Old Port, 300-420m, 4 v, 13.ii.1970, MO 28474; Elat, opposite Old Port, 300-420m, 11 v, 13.ii.1970, MO 28455; Gulf of Aqaba, 410m, several v, HUI 706; Gulf of Aqaba, 700-740m, 4 v, HUI 787; Elat, 300m, several v, HUI 20692; Gulf of Aqaba, 192m, several v, HUI 20696; Elat, 280-300m, 6 v, HUI 21495; Gulf of Aqaba, 30-35m, 3 v, HUI 35594; Gulf of Aqaba, 30-35m, HUI 35597; Elat, harbour, 7 v, HUI 35603; Dahlak Archipelago, 15°18'N, 40°23'E, 55m, 1 v, 16.x.1965, ISRSE 1965-0153.

Distribution: Northwestern and western Indian Ocean, Red Sea and Persian Gulf. Sublittoral to bathyal depths, living on soft substrates.

Remarks: Most Red Sea specimens are finely radially striated only near the anterior and posterior margins, and smooth on the central part of the disc. The internal ribs vary from 8-11, sometimes with rudimentary intercostal radial riblets. The right valve is smooth or finely sculptured commarginally. Perhaps only a smooth form of *Parvamussium siebenrocki* (Sturany, 1901).

For description of the present species see Oliver (1992: 73 [as *Propeamussium cf. scitulum*]).

Parvamussium siebenrocki (Sturany, 1901)

(Plate 1, figs. 1-4)

**Amussium siebenrocki* Sturany, 1901: 269, pl. 4, figs. 5-8.

Amussium siebenrocki.- Cox, 1929: 207.

Parvamussium siebenrocki.- Oliver, 1982: 2.

Parvamussium siebenrocki.- Bosch, Dance, Moolenbeek & Oliver, 1995: 232, fig. 1011.

Propeamussium (Parvamussium) siebenrocki.- Oliver, 1992: 70, 73, pl. 12, figs. 3a-3b, text-figs. 7a-b.

Type material: Figured syntype (lv) (Sturany, 1901: pl. 4, figs. 7-8) (NHMW 84.355), 8 syntypes (2 lv + 6 rv) NHMW 84.177.

Type locality: 'Pola' stn. 72, Red Sea, near Shadwan Island, 27°25'N, 34°30'E, 1082 m, yellowish muddy sand, 2 April 1896.

Material examined:

The type material. RED SEA: Elat, off Marine Lab., MO 28545, 215m, 9 v, 6.ix.1966; Elat, off Marine Lab., MO 28546, 400-450m, 2 v, 6.ix.1966; Elat, off Marine Lab., MO 28549, 215m, 4 v, 6.ix.1966; Elat, off Marine Lab., MO 28543, 600m, 2 v, 6.ix.1966; Elat, opposite Old Port, MO 28539, 121m, 7 v, 10.ix.1968; Elat, opposite Oil Port, MO 28540, 300-420m, 1 v, 13.ii.1970; Elat, opposite Oil Port, MO 28550, 344m, 2 v, 10.ix.1968; Elat, opposite Oil Port, MO 28544, 350m, 19 v, 16.ix.1968; Elat, opposite Oil Port, MO 28548, 350m, 8 v, 16.ix.1968; Elat, opposite Ras Taba, MO 28541, 690m, 3 v, 17.xi.1969; Elat, opposite Lighthouse, MO 28542, 300m, 1 v, 11.ii.1970; Elat, opposite Ras Taba, MO 28551, 700m, 2 v, 12.ii.1970; Elat, 280-300m, 1lv, HUI 21494; Elat, 250-300m, HUI 35588; S of

Nuweiba, MO 28538, 550-700m, 25 v, 8.x.1969; S of Nuweiba, MO 28547, 550m, 16 v, 8.x.1969.

Distribution: Red Sea, Gulf of Aden, Arabian Sea and Persian Gulf to northern eastcoast of South Africa. Sublittoral to bathyal depths, living on soft substrates (mud, muddy sand).

Remarks: As mentioned by Sturany (1901: 269) internal ribs are supplemented with rudimentary interstitial riblets in some specimens, but generally are 10 in number. The external sculpture of the left valve is variable; some specimens lack commarginal lamellae, some are more cancellated.

For description of the present species see Oliver (1992: 73).

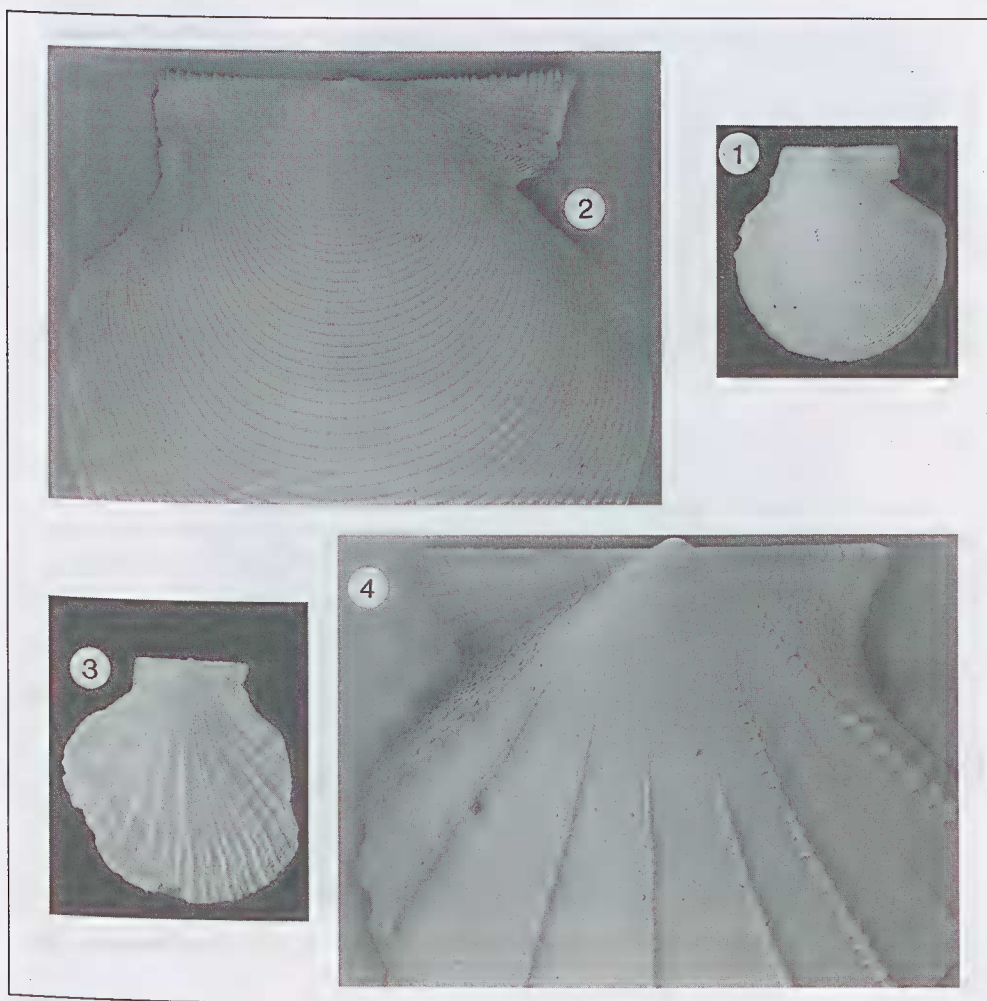


Plate 1.

Figures 1-4. *Parvoamussium siebenrocki* (Sturany, 1901). 1. TAU-MO 28547, S of Nuweiba, 550m, H 6.0mm, rv, exterior. 2. idem, H 5.5mm, rv, exterior. 3. TAU-MO 28539, Elat, opp. Old Port, 121m, H 10.7mm, lv, exterior. 4. idem, H 6.0mm, lv, exterior.

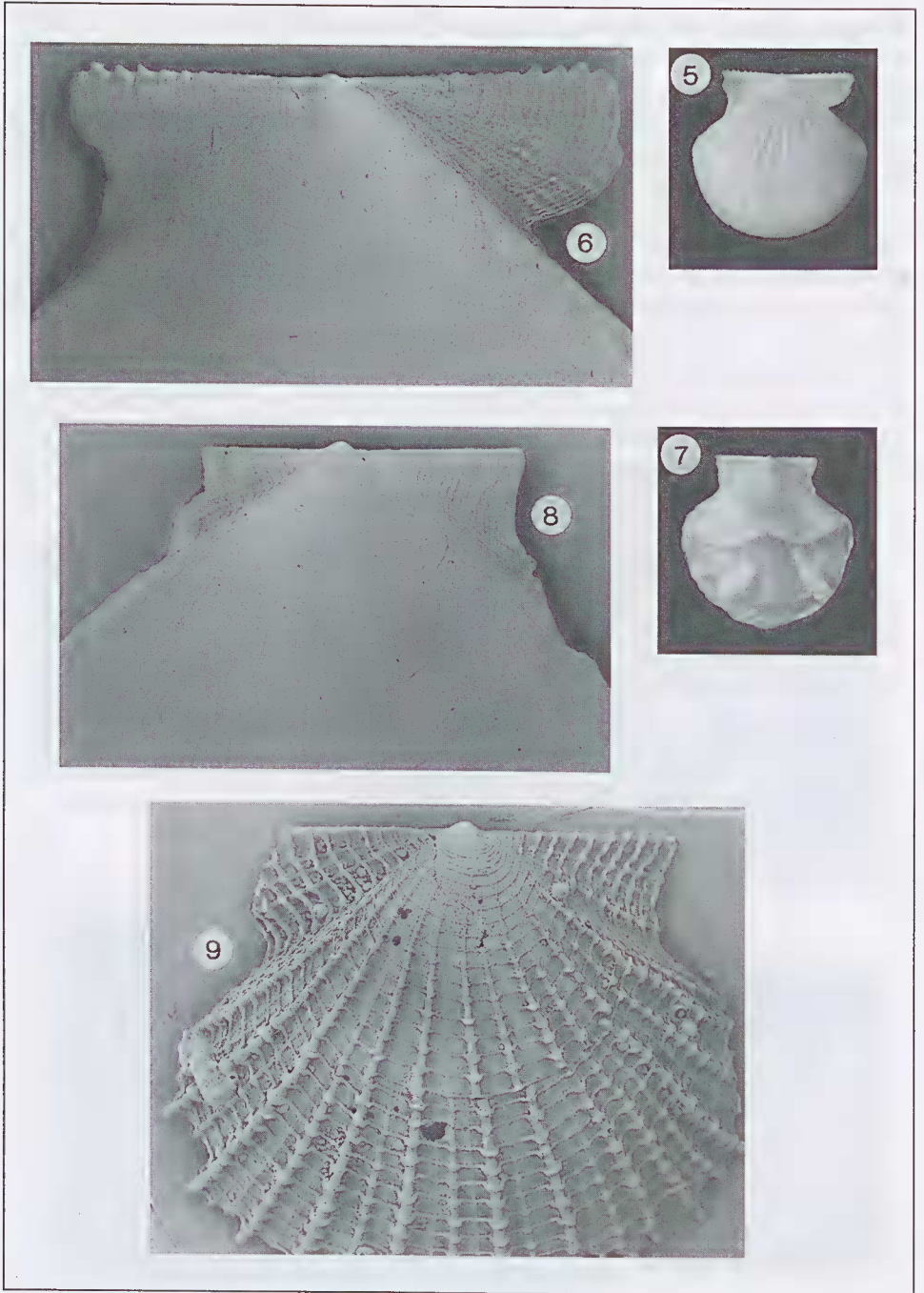


Plate 2.

Figures 5-8. *Parvamussium formosum* (Melvill in Melvill & Standen, 1907). 5. TAU-MO 28450, Elat, opp. Zarkin Plant., 167m, H 11.0mm, rv, exterior. 6. idem, H 10.6mm, rv, exterior. 7. TAU-MO 28460, Elat, opp. Old Port, 121m, H 9.9mm, lv, exterior. 8. idem, H 9.6mm, lv, exterior. 9. *Parvamussium thyrideum* (Melvill in Melvill & Standen, 1907). TAU-MO 28553, off Nuweiba el Tarabin, 137-146m, H 3.0mm, lv, exterior.

Parvamussium thyrideum (Melvill in Melvill & Standen, 1907)
(Plate 2, fig. 9)

**Pecten thyrideus* Melvill in Melvill & Standen, 1907: 809, pl. 55, figs. 10-10a.

Parvamussium thyrideus.- Oliver, 1982: 2; Bosch, Dance, Moolenbeek & Oliver, 1995: 232.

Pecten thyrideus.- Trew, 1987: 67.

Propeamussium (Parvamussium) thyrideum.- Oliver, 1992: 70, 73, text-fig. 6.

Type material: Figured syntype (valve) and 3 other syntypes (valves) BMNH 1907.5.33-37; 7 syntypes (valves) NMW 1955.158.679. Several syntypes are distributed to other museums (Dijkstra, personal observation).

Type locality: Gulf of Oman, 24°58'N, 56°54'E, 156 fathoms [= 285 m], shell-sand.

Material examined: The type material. RED SEA: Elat, opposite New Port, MO 28552, 220m, 1 v (fragment), 16.ix.1968; Elat, opposite Electric Plant., MO 28554, 320m, 2 v, 9.ii.1970; off Nuweiba el Tarabin, MO 28553, 137-146m, 1 v, 8.x.1969.

Distribution: Red Sea, Gulf of Oman, Arabian Sea and Persian Gulf. Sublittoral to bathyal depths, living on soft substrates (sand and shellgrit).

Remarks: Some specimens have internal irregularly arranged rudimentary radial ribs near the periphery; these are absent in others.

For description of the present species see Oliver (1992: 73).

Genus *Similipecten* Winckworth, 1932

Similipecten Winckworth, 1932: 241, 250.

Type species (by original designation): *Pecten similis* Laskey, 1811; Recent, E Atlantic.

Diagnosis: A free-living, small to medium sized, compressed propeamussiid; shell semi-orbicular, generally transparent, slightly opaque, smooth or sculptured with minute commarginal growthlines or fine striae; anterior and posterior auricles well developed, nearly equal in length; byssal notch moderately slight; no ctenolium; cardinal crura rather broad.

Distribution: Eocene - Recent (Hertlein, 1969: N354); Arctic to tropical Atlantic, NW Indian Ocean to Indo-West Pacific; littoral (Arctic and boreal region) to bathyal depths.

Remarks: Hertlein (1969: N354) placed *Similipecten* Winckworth in the *Eburneopecten* group of Pectinidae as a synonym of *Palliolum (Delectopecten)* Stewart, 1930. However, Waller (1984: 213) treated *Similipecten* as a valid genus of the Propeamussiidae.

Similipecten eous (Melvill in Melvill & Standen, 1907)
(Plate 3, figs. 10-11)

**Pecten eous* Melvill in Melvill & Standen, 1907: 808, pl. 55, fig. 9.

Delectopecten eous.- Oliver, 1982: 3.

Pecten eous.- Trew, 1987: 38.

Similipecten eous.- Oliver, 1992: 74, text-figs. 9a-b; Bosch, Dance, Moolenbeek & Oliver, 1995: 232.

Type material: Lectotype (Melvill & Standen, 1907: pl. 55, fig. 9) here designated (BMNH 1907.5.3.18). Two paralectotypes (valves and fragments): BMNH 1907.5.3.19-20. Seventeen paralectotypes (valves): NMW 1955.158.673. Other paralectotypes in several other museums (Dijkstra, personal observation).

Type locality: Gulf of Oman, 24°58'N, 56°54'E, 285m, shell-sand.

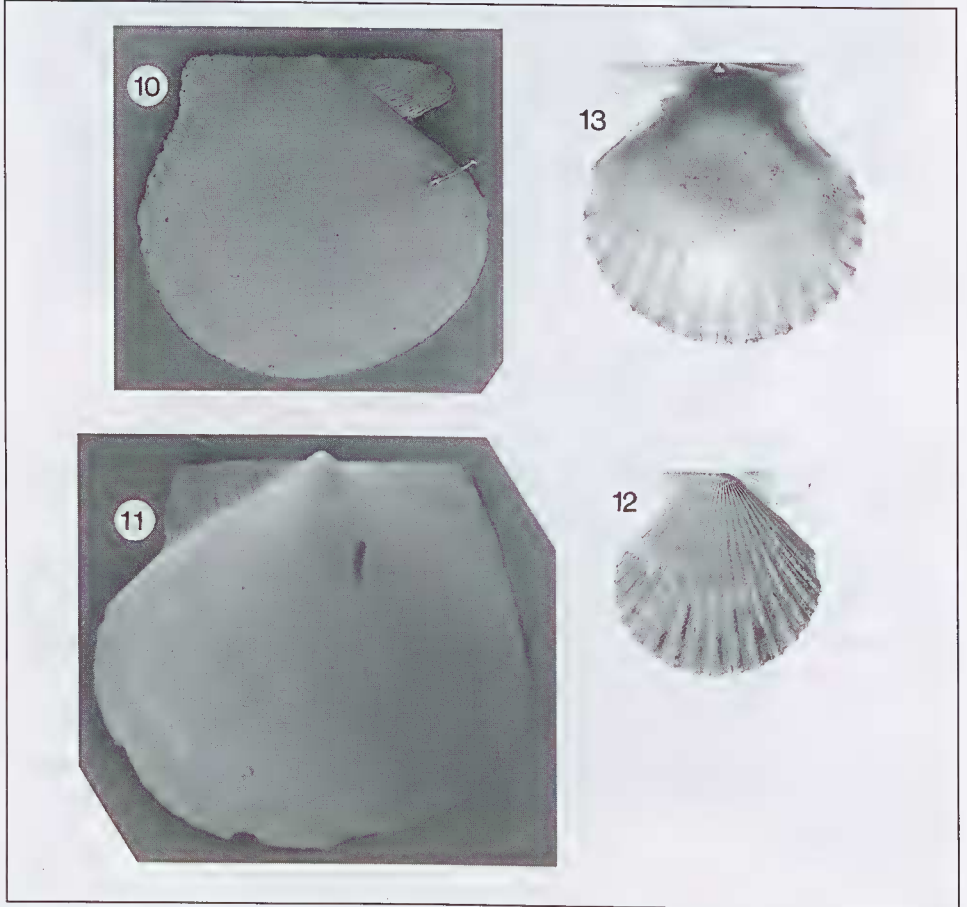


Plate 3.

Figures 10-11. *Similipecten eous* (Melvill in Melvill & Standen, 1907). 10. TAU-MO 28482, Elat, off Zarkin Plant., 167m, H 2.8mm, rv, exterior. 11. idem, H 3.8mm, lv, exterior. 12-13. *Cryptopecten nux* (Reeve, 1853). 12. TAU-MO 28501, off Elat, 40-50m, H 13.6mm, rv, exterior. 13. idem, rv, interior.

Material examined: The type material. RED SEA: off Elat, MO 28484, 180-200m, 3 v, 6.ix.1966; Elat, off Marine Lab., MO 28497, 215m, 14 v, 6.ix.1966; Elat, off Marine Lab., MO 28483, 400-450m, 1 v, 6.ix.1966; Elat, off Marine Lab., MO 28481, 215m, 11 v, 6.ix.1966; Elat, off Marine Lab., MO 28499, 600m, 2 v, 6.ix.1966; off Elat, MO 28492, 80m, 4 v, 7.ix.1966; Elat, opposite New Port, MO 28493, 220m, 10 v, 16.ix.1968; Elat, opposite New Port, MO 28496, 220m, 5 v, 16.ix.1968; Elat, off Zarhin Plant., MO 28494, 167m, 1 v, 16.ix.1968; Elat, off Zarhin Plant., MO 28482, 167m, 53 v, 16.ix.1968; Elat, opposite Oil Port, MO 28479, 350m, 2 v, 16.ix.1968; Elat, opposite Oil Port, MO 28480, 350m, 2 v, 16.ix.1968; off Nuweiba el Tarabin, MO 28488, 150m, 1 v, 8.x.1969; off Wadi Murach, MO 28490, 80m, 1 v, 9.x.1969; Elat, opposite Ras Taba, MO 28495, 690m, 3 v, 17.xi.1969; Elat, MO 28486, 242m, 2 v, 17.xi.1969; Elat, opposite Marine Lab., MO 28485, 600m, 1 v, 9.ii.1970; Elat, opposite New Port, MO 28491, 270m, 10 v, 13.ii.1970; Elat, opposite New Port, MO 28489, 270m, 2 v, 13.ii.1970; Elat, opposite New Port, MO 28487, 270m, 3 v, 13.ii.1970; Elat, opposite Old Port, MO 28498, 300-420m, 3 v, 13.ii.1970; Gulf of Aqaba, 4 v, HUIJ 20697; Gulf of Aqaba, 1 v, HUIJ 35593; Elat, harbour, 5 v, HUIJ 35604.

Distribution: Red Sea, Gulf of Oman, Arabian Sea, Persian Gulf and Indonesia (Dijkstra, 1991b: 23). In sublittoral to bathyal zone, living on soft substrates (mud, muddy sand, shellgrit).

Remarks: The present species is morphologically closely allied to *Similipecten similis* (Laskey, 1811) from the eastern Atlantic and Mediterranean Sea. The latter species is more colourful and larger (up to 6mm high).

For description of the present species see Dijkstra (1991b: 23).

Family PECTINIDAE Wilkes, 1810
Subfamily CAMPTONECTINAE Habe, 1977
Genus *Delectopecten* Stewart, 1930

Delectopecten Stewart, 1930: 118.

Type species (by original designation): *Pecten (Pseudamusium) vancouverensis* Whiteaves, 1893; living, Forward Inlet, Quatsino Sound, Vancouver Island, 18-37m. For diagnosis, distribution and remarks see Dijkstra (1995: 50).

Delectopecten musorstomi Poutiers, 1981
(Plate 7, figs. 31-32)

**Delectopecten musorstomi* Poutiers, 1981: 331, pl. 1, figs. 2-3.

Delectopecten musorstomi.- Dijkstra, 1991b: 26; 1995: 53, figs. 69-70.

Type material: Holotype MNHN [not registered].

Type locality: Philippines, N of Lubang, 13°57'N, 120°16.5'E, 150-159m, live, sediments (gravel, coral rubble), 21.iii.1976.

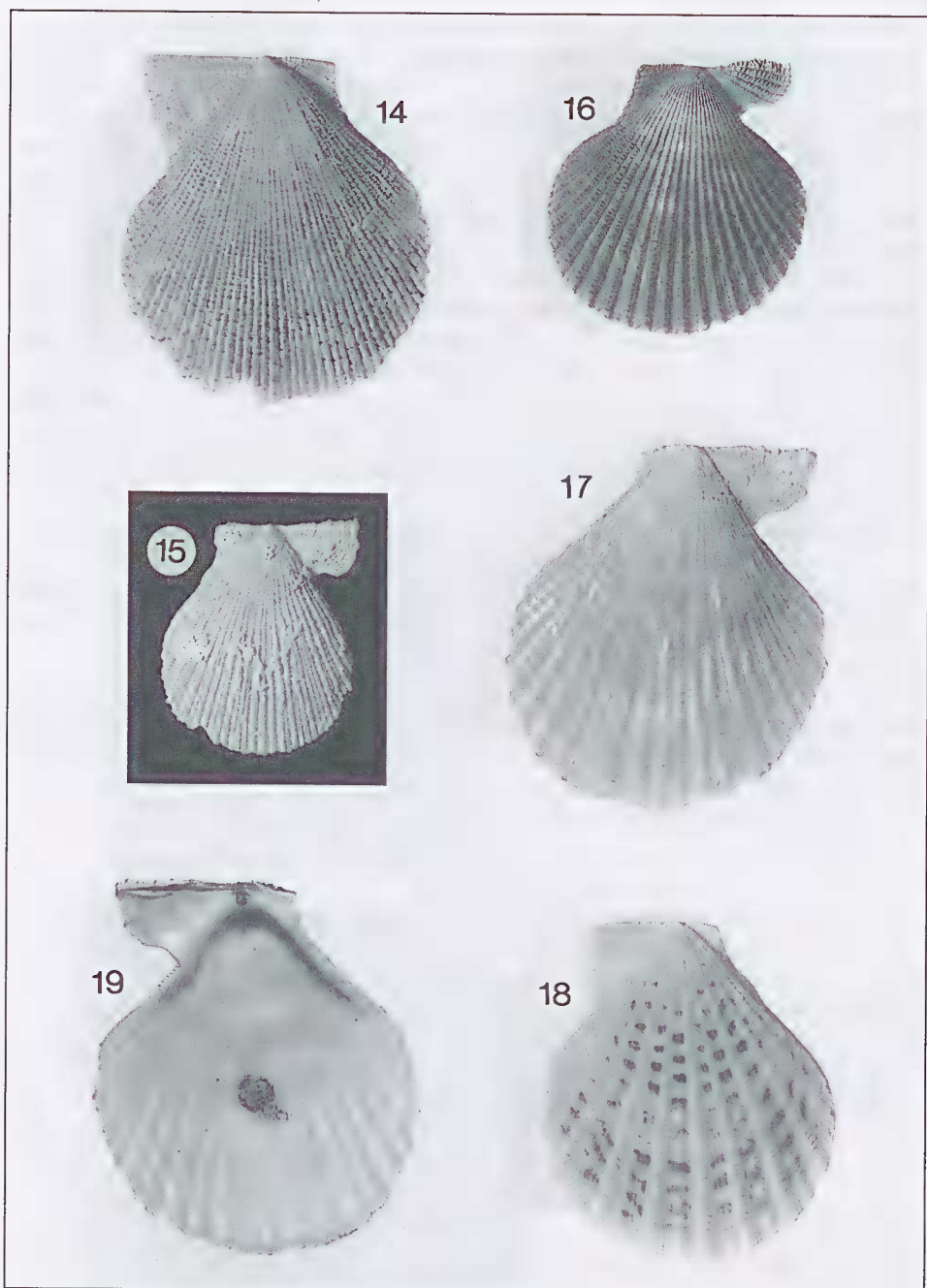


Plate 4.

Figures 14-15. *Mimachlamys andamanica* (Preston, 1908). 14. TAU-MO 28466, Elat, opp. New Port, 170-270m, H 8.3mm, lv, exterior. 15. TAU-MO 28441, Elat, off Old Port, 121m, H 13.0mm, rv, exterior. 16. *Mimachlamys senatoria* (Gmelin, 1791). ISRSE/1965-2544, Dahlak Archipelago, 36m, H 45.5mm, rv, exterior. 17-19. *Laevichlamys rubromaculata* (G.B. Sowerby 2nd, 1842). 17. ZMUC, Elat, H 29.9mm, rv, exterior. 18. idem, H 27.9mm, lv, exterior. 19. idem, H 29.9mm, rv, interior.

Material examined: The type material. RED SEA: Elat, opposite Old Port, 121m, 1 v, 10.ix.1968, MO 28508; Elat, opposite Oil Port, 344m, 1 v, 10.ix.1968, MO 28550; Elat, opposite Oil Port, 350m, 1 v (fragment), 16.ix.1968, MO 28532.

Distribution: So far Red Sea, Philippines and New Caledonia. Sublittoral depths, living on soft sediments.

Remarks: Knudsen (1967: 282) mentioned *Delectopecten alcocki* (Smith, 1904) from the Gulf of Aden. That species differs from *D. musorstomi* in lacking the radial riblets on the left valve and in the microscopic sculpture of antimarginal striae ('*Camptonectes*' sculpture) on both valves.

For description of the present species see Dijkstra (1995: 53).

Tribe **DECATOPECTININI** Waller, 1986

Genus **Decatopecten** [Rüppell] G.B. Sowerby 2nd, 1839

Decatopecten [Rüppell] G.B. Sowerby 2nd, 1839: 37, fig. 172.

Type species (by monotypy): *Ostrea plica* Linnaeus, 1758; Recent, tropical Indo-Pacific.

Synonyms:

Pallium Klein, 1753: 131 [not binomial].

Pallium Martini, 1774: 129 [not binomial].

Pallium Schumacher, 1817: 41, 120 [not of Schröter, 1802; junior synonym of *Pecten* Müller, 1776 (s.l.)]. Type species (by monotypy): *Pallium striatum* Schumacher, 1817 [junior synonym of *Ostrea plica* Linnaeus, 1758]; Recent, Indo-West Pacific.

Decadopecten Swainson, 1840: 388. Type species (by monotypy): *Pecten plicata* G.B. Sowerby 2nd, 1839 [error for *Pecten plica* G.B. Sowerby 2nd, 1839, junior synonym of *Ostrea plica* Linnaeus, 1758].

Dentipecten [Rüppell] Gray, 1847: 200. Type species (by original designation): *Ostrea plica* Linnaeus, 1758 [objective; Hertlein, 1969: N365].

Comptopallium Iredale, 1939: 359. Type species (by original designation): *Comptopallium pauciplicatum* Iredale, 1939 [junior synonym of *Ostrea radula* Linnaeus, 1758]; Recent, Queensland, Australia.

Diagnosis: Free swimming member of the Decatopectinini, suborbicular to elongate, laterally compressed; shell with 3-15 rounded radial costae, sculptured with closely arranged commarginal lamellae, anterior and posterior auricles subequal to equal, byssal notch nearly absent, no byssal fasciole, ctenolium weakly developed.

Distribution: Miocene-Recent (Hayami, 1989: 15); Indo-Pacific; littoral to sublittoral depths.

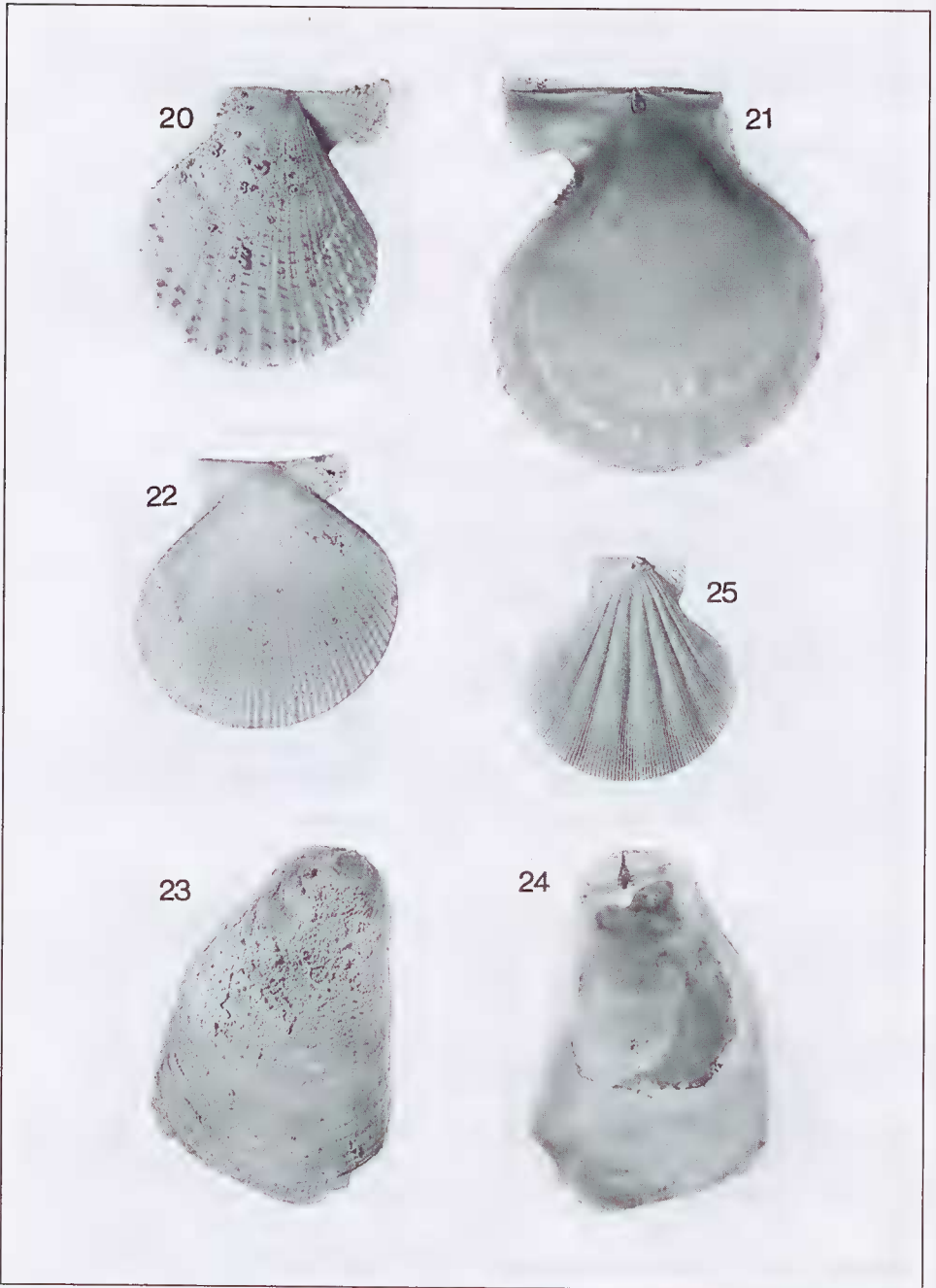


Plate 5.

Figures 20-21. *Laevichlamys superficialis* (Forsskal, 1775). TAU-MO 28533, Bilaiyim Lagoon, H 36.0mm. 20. rv, exterior. 21. rv, interior. 22. *Juxtamusium maldivense* (E.A. Smith, 1903). TAU-MO 28563, off Gesirat Farún, 50m, H 13.5mm, rv, exterior. 23-24. *Pedum spondyloideum* (Gmelin, 1791). HUIJ 30483, Elat, H 108mm, spm. 23. lv, exterior. 24. lv, interior. 25. *Decatopecten amiculum* (Philippi, 1851). ISRSE/0155, Dahlak Archipelago, 18-22m, H 41.5mm, rv, exterior.

Remarks: Hertlein (1969: N365) placed *Decatopecten* in a suprageneric *Decatopecten* group, whereas Waller (1986: 40) and subsequently Vaught (1989: 119) placed it in the new tribe Decatopectinini Waller, 1986 with the type genus *Decatopecten* Rüppel [sic] in G.B. Sowerby 2nd, 1839.

Decatopecten amiculum (Philippi, 1851)

(Plate 5, fig. 25, plate 9, figs. 42-43)

-*Pecten amiculum* Philippi, 1851: 89.

**Pecten flabelloides* Reeve, 1852: spec. 21, pl. 4, figs. 21a, 21b.

**Pecten helleri* Preston, 1909: 139, pl. 22, fig. 15 (Syn. nov.).

Pecten flabelloides.- P. Fischer, 1871: 212; Küster & Kobelt, 1888: 66, pl. 17, fig. 11; Shopland, 1902: 171.

Pecten flabelloides.- Shopland, 1896: 234.

Chlamys (Pallium) amiculum.- Lamy, 1935: 313.

Decatopecten amiculum.- Abbott & Dance, 1982: 307, illustr.; Oliver, 1982: 14; 1992: 77, pl. 12, fig. 9; Bernard, Cai & Morton, 1993: 51.

Decadopecten (Decadopecten) amiculum.- Rombouts, 1991: 36, pl. 13, fig. 7.

Type material: *Pecten amiculum* Philippi: Not traced in ZMB, or MNHNS (pers. comm. Dr. O.G. Herrera, 25 September 1989); *Pecten flabelloides* Reeve: Lectotype BMNH 1996403/1 herein designated, figured in Reeve (1852: sp. 21, pl. 4, fig. 21a), 2 paralectotypes BMNH 1996403/2-3; *Pecten helleri* Preston: Holotype, BMNH 1915.1.6.47.

Type localities: *P. amiculum*: "Madagascar" [Malagasy Republic]; *P. flabelloides*: Moluccas [Maluku], Indonesia; *P. helleri*: "Ceylon" [Sri Lanka].

Material examined: The type material. RED SEA: Um Rashrash, 1 v, HJ 35739. GULF OF ADEN: Djibouti, 4m, among sand and rubble, 1 spm., HD 2131; Djibouti, 20-30m, soft sediments, live, 6 spms., HD 2176; Yemen, off Abyan, 20m, soft substrates, 1 v, HD 2835.

Distribution: Red Sea, Gulf of Aden, east coast of Africa to Natal (South Africa), Persian Gulf, extending eastwards to the Philippines and Indonesia. Littoral to sublittoral depths, living free on soft substrates.

Remarks: The present species differs mainly from the closely related species *Decatopecten plica* (Linnaeus, 1758) by having more weakly developed radial plicae (7-11), which are usually more compressed.

For description of the present species see Rombouts (1991: 36) and Oliver (1992: 77).

Decatopecten plica (Linnaeus, 1758)

(Plate 9, figs. 40-41)

**Ostrea plica* Linnaeus, 1758: 697.

Pecten plicatus Chemnitz, 1784: 292, pl. 62, figs. 598a-b [not binomial].

**Pallium striatum* Schumacher, 1817: 120, pl. 4, figs. 4a-b.

**Pecten subplicatus* G.B. Sowerby 2nd, 1842: 64, pl. 13, fig. 37, pl. 14, figs. 72, 73, 81.

Ostrea plica.- Linnaeus, 1764: 526; 1767: 1145; Gmelin, 1791: 697; Dillwyn, 1817: 252; Wood, 1825: 48, pl. 10, fig. 13; Hanley, 1855: 105; Dodge, 1952: 169.

Pecten plicatus Chemnitz, 1784: 292, pl. 62, figs. 598a-b [not binomial].

----- Savigny, 1817: pl. 13, fig. 6.

Pecten plica.- Lamarck, 1819: 167; Deshayes, 1836: 136; G.B. Sowerby 2nd, 1842: 65, pl. 20, figs. 237; Chenu, 1843: 5, pl. 16, figs. 9-12; Catlow & Reeve, 1845: 82; Reeve, 1852: spec. 16, pl. 3, fig. 16; Vaillant, 1865: 112; Issel, 1869: 104, 372; Dunker, 1882: 242; Cooke, 1886: 135; Küster & Kobelt, 1888: 53, pl. 14, figs. 3-4; Paetel, 1890: 232; Smith, 1891: 434; Stearns & Pilsbry, 1895: 144; Anthony, 1906: 499; Hall & Standen, 1907: 67; Melvill & Standen, 1907: 809; Melvill, 1909: 127; Ryland, 1951: 22.

Pecten ----- Audouin, 1828: 208, pl. 13, fig. 6.

Pecten velutinus G.B. Sowerby 2nd.- Issel, 1869: 383.

Pecten (Pallium) plica.- Macandrew, 1870: 449; Hall & Standen, 1907: 67; Lyngø, 1909: 60.

Pallium plica.- Smith, 1903: 622; Lamy, 1935: 313.

Chlamys plica.- Pallary, 1926: 121, pl. 17, fig. 6; Kuroda, 1931: 83; Pallary, 1932: 317; Barnard, 1964: 430; Smythe, 1979: 71.

Chlamys (Pallium) plica.- Lamy, 1928: 219; Dautzenberg, 1929: 562; Lamy, 1938: 13; Moazzo, 1939: 32.

Chlamys (Decatopecten) plica.- Cox, 1929: 201, 205; Eames & Cox, 1956: 49.

Decatopecten plica.- Habe, 1951: 78; Kira, 1962: 174, pl. 53, fig. 11; Mastaller, 1979: 142; Bosch & Bosch, 1982: 159, illustr.; Oliver, 1982: 14; 1992: 72, text-figs. 20a-b, 77, pl. 12, figs. 8a-b [references, description]; Bosch, Dance, Moolenbeek & Oliver, 1995: 232, fig. 1008; Dijkstra, 1997: 330, fig. 36.

Decatopecten (Decatopecten) plica.- Hertlein, 1969: 365, figs. C87: 4a-b.

Decatopecten plica.- Habe, 1977: 85; Abbott & Dance, 1982: 307, illustr.; Bernard, Cai & Morton, 1993: 51.

Decatopecten (Decatopecten) plica.- Rombouts, 1991: 37, pl. 13, figs. 8, 8a.

Decatopecten striatus.- Bernard, Cai & Morton, 1993: 51.

Type material: *Ostrea plica* Linnaeus: Lectotype (designated by Dijkstra, in press) and 2 paralectotypes, LSL [not registered]; one paralectotype and 2 possible paralectotypes, UUZM; *Pallium striatum* Schumacher: 2 syntypes ZMUC [not registered]; *Pecten subplicatus* G.B. Sowerby 2nd: No specimens in the BMNH at London resemble Sowerby's figures or descriptions, therefore type material is not available (J. Pickering and K. Way, pers. comm.).

Type localities: *Ostrea plica*: 'O. Indico', restricted to Indonesia by Dijkstra [in press]; *Pallium striatum*: Indonesia; on label "Canton"; *Pecten subplicatus*: "Amboina" [Ambon, Maluku, Indonesia].

Material examined: The type material. RED SEA: Suez, 1 v, HUI 35738; Ras Matarma, beach, 3 v, HD 3354; Aqaba, 1 v, HUI 35737; off Elat, 2-4m, under stone, sand, 1 spm., HD 173; off Elat, 2-4m, under rock, live, 1 spm., HD 397; off

Hurghada, 20-40m, soft substrates, live, 8 spms., HD 3343; Ras Sudr, 1 v, HUI 21586; Um Rashrash, 2 v, HUI 35739; off Ras Sudr, beach, 1 v, 25.x.1971, NS 8581; off Ras-el-Kanisa, 1 spm. (juv.), 28.x.1971, NS 8534; Dahlak Archipelago, 15°17'N, 40°10'E, 18-22m, 1 v, 16.x.1965, ISRSE 0155; Dahlak Archipelago, 15°17'N, 40°10'E, 18-22m, 1 v (juv.), 16.x.1965, ISRSE 0162; Dahlak Archipelago, 15°58'N, 40°19'E, 9-12m, 1 spm., 17.x.1965, ISRSE 2590; Dahlak Archipelago, 27-37m, 1 v, 1 fragment, 19.x.1965, ISRSE 1389; Dahlak Archipelago, 15°35'N, 40°40'E, 20-24m, 1 spm., 22.x.1965, ISRSE 1695a.

Distribution: Red Sea, Gulf of Aden, east coast of Africa to South Africa, Malagasy, Réunion, Mauritius, Arabian Sea, Persian Gulf, extending to southern Japan and southwards to Indonesia. Subtidal to sublittoral depths, living on soft sediments (mud, sand with rubble).

Remarks: This widely distributed species consistently varies in number of radial costae (3-5), thickness, convexity and colour.

D. amiculum (Philippi) is a closely related species having the same distribution. *P. striatum* and *P. subplicatus* are morphologically similar to the type specimen of *O. plica* and come from the same area.

For the description of the present species see Oliver (1992: 77).

Genus *Excellichlamys* Iredale, 1939

Excellichlamys Iredale, 1939: 366.

Type species (by original designation): *Pecten spectabilis* Reeve, 1853; Recent, locality unknown.

Diagnosis: Free-living member of Decatopectinini, orbicular to elongate, laterally compressed, equilateral, right valve more convex than left, with 8-11 radial plicae, sculptured with closely spaced commarginal lamellae, anterior and posterior auricles equal to unequal, byssal notch rather deep, byssal fasciole relatively wide, ctenolium weakly developed.

Distribution: Miocene-Recent (Hayami, 1989: 15); Indo-West Pacific; littoral to sublittoral depths.

Remarks: Hertlein (1969: N366) treated *Excellichlamys* as a subgenus of *Semipallium* [Jousseume] Lamy, 1928, placed in the suprageneric group *Decatopecten*. However, Waller (1986: 40) and subsequently Vaught (1989: 119) treated *Excellichlamys* as an extant genus in the tribe Decatopectinini.

Excellichlamys spectabilis (Reeve, 1853)

(Plate 6, figs. 26-27)

**Pecten spectabilis* Reeve, 1853: spec. 128, pl. 29, fig. 128.

Pecten histrionicus (Gmelin) var.- Petit, 1853: 150, pl. 5, fig. 2.

Pecten spectabilis.- Reeve, 1860: 58; Lischke, 1871: 159; Martens, 1880: 314; Küster & Kobelt, 1888: 61, pl. 16, fig. 3; Paetel, 1890: 234; Stearns & Pilsbry, 1895: 14.

Chlamys spectabilis.- Hidalgo, 1904: 380.

Pecten (Aequipecten) histrionicus var. *spectabilis*.- Dautzenberg & Bavay, 1912: 22.
Chlamys (histrionica var. ?) *spectabilis*.- Kuroda, 1932: 95.
Aequipecten histrionicus var. *spectabilis*.- Lamy, 1935: 314.
Chlamys histrionicus [sic] var. *spectabilis*.- Viader, 1937: 61.
Excellichlamys spectabilis.- Iredale, 1939: 366; Cotton, 1964: 10; Thornley, 1968: 9;
 Kira, 1967: 139, pl. 50, fig. 2; Kuroda, Habe & Oyama, 1971: 366, pl. 79, figs. 12-13; Waller, 1972: 224, 225F, 227, 246-250, 247F, 247T, 248T, 258, 259, pl. 5, figs. 87-92, pl. 6, figs. 93-102 [references, description, distribution, ecology]; Abbott & Dance, 1982: 308; Oliver, 1982: 15; Bernard, Cai & Morton, 1993: 51 [distribution]; Mühlhäusser, 1985: 9; Dijkstra, 1987a: 9, illustr.; 1991b: 44 [references]; 1997: 327, figs. 24-27; Oliver, 1992: 72, 77, pl. 14, figs. 1a-b, text-figs. 22a-b.
Excellichlamys cf. *spectabilis*.- Sharabati, 1984: pl. 44, figs. 6-6a.

Type material: Holotype UMZC 1461.

Type locality: Unknown.

Material examined: The type material. RED SEA: Elat, 1 spm., 1 v, MO 28534; Elat, 3 v, HUI 21581; Elat, 1 spm. + 5 v, HUI 35730; Elat, 4-8m, among coral rubble, live, 1 spm., HD 177; S of Elat, 6-8m, among coral rubble, live, 1 spm., HD 398; 20km S of Elat, 10-15m, amongst coral, live, 2 spms., HD 3021; Aqaba, 2 v, HUI 35731; Aqaba, 3 v, HUI 35732.

Distribution: Red Sea, east coast of Africa to South Africa, Réunion, Mauritius, extending eastwards to southern Japan and New Caledonia. Subtidal to sublittoral depths, living byssally attached under rocks or corals or amongst coral rubble on sand.

Remarks: Present material from the Red Sea is variable in radial costae (3-5 prominent radial costae with lower intercostal ribs, which are also variable in number). In some specimens the left valve is more convex than in the type material, and compressed near the ventral margin. The auricles are very unequal, but not as strongly as in Polynesian material.

Excellichlamys xishaensis (Wang, 1985) from the tropical western Pacific is morphologically similar to Polynesian specimens, known as *Excellichlamys parva* (G.B. Sowerby 1st, 1835), which name is preoccupied by Da Costa (1778). *E. xishaensis* differs from the present species in its strongly unequal auricles and fewer primary radial costae.

For description of the present species see Waller (1972: 247).

Genus *Glorichlamys* Dijkstra, 1991

Glorichlamys Dijkstra, 1991b: 45.

Type species (by original designation): *Pecten elegantissimus* Deshayes, 1863; Recent, Réunion. For diagnosis and comparison see Dijkstra (1991b: 45).

Distribution: Recent; Indo-West Pacific; littoral to sublittoral depths.

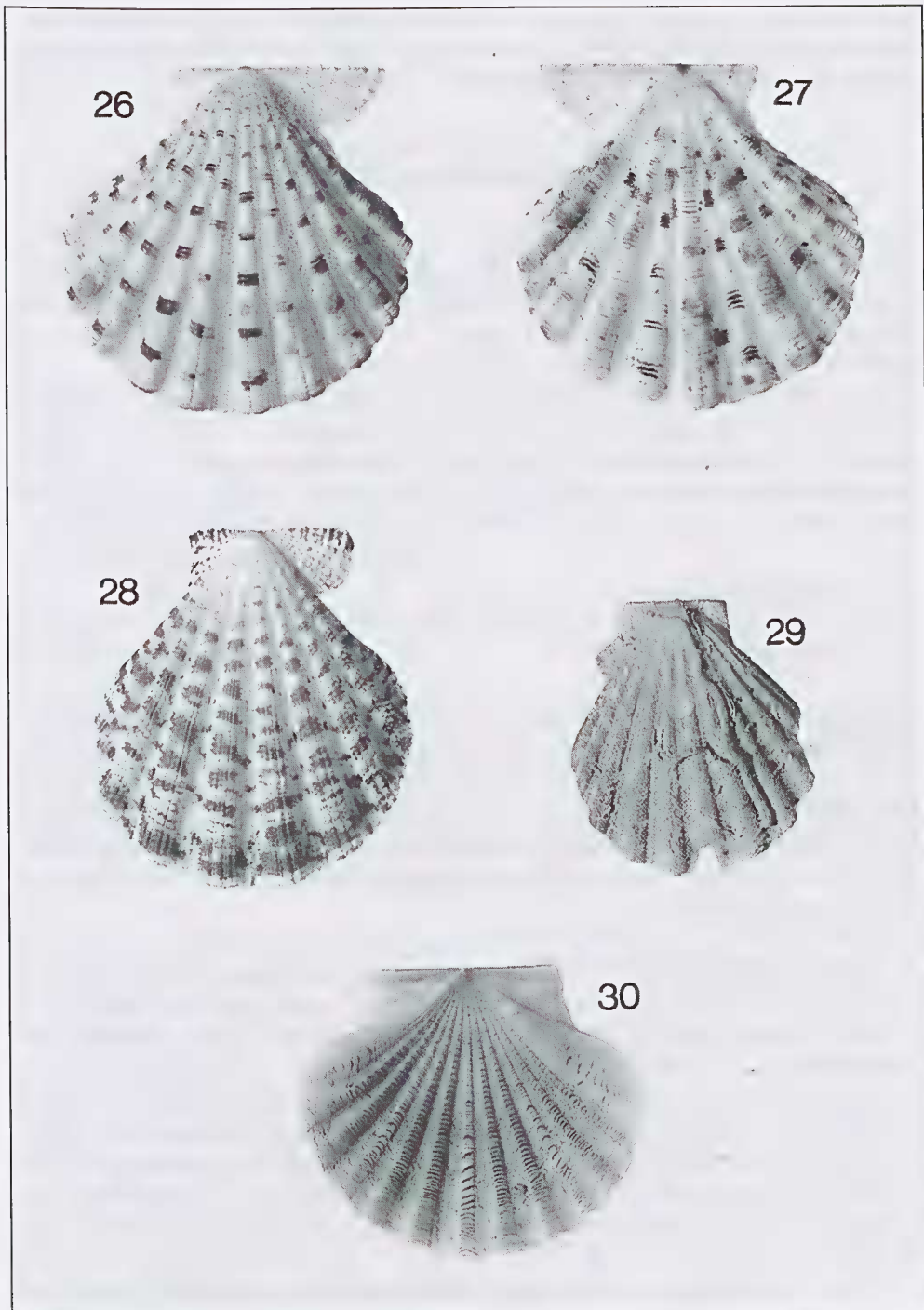


Plate 6.

Figures 26-27. *Excellichlamys spectabilis* (Reeve, 1853). TAU-MO 28534, Elat, H 26.0mm, spm. 26. rv, exterior. 27. lv, exterior. 28. *Gloripallium maculosum* (Forskål, 1775). ZMUC, Elat, H 51.9mm, rv, exterior. 29. *Sempallium crouchi* (E.A. Smith, 1892). TAU, off Mersat Abu Samra, 132-137m, H 12.6mm, lv, exterior. 30. *Pecten erythraensis* G.B. Sowerby 2nd, 1842. TAU-NS 16466, off Ras Abu Rudeis, 42-46m, H 40.9mm, lv, exterior.

Remarks: *Glorichlamys* was placed by Dijkstra (1991b: 45) in the tribe Decatopectinini Waller, 1986, and compared with *Gloripallium* Iredale, 1939, *Excellichlamys* Iredale, 1939, and *Bractechlamys* Iredale, 1939.

Glorichlamys quadrilirata (Lischke, 1870)
(Plate 10, figs. 46-47)

-Pecten quadriliratus Lischke, 1870: 29.

Pecten quadriliratus.- Lischke, 1871: 158, pl. 9, figs. 5-6; Dunker, 1882: 240; Küster & Kobelt, 1888: 136, pl. 37, figs. 6-7; Paetel, 1890: 233; Pilsbry, 1895: 144; Bavay, 1905: 29; Yokoyama, 1924: 57, pl. 4, fig. 10.

Pecten (Chlamys) quadriliratus.- Dautzenberg & Bavay, 1912: 4.

Chlamys quadrilirata.- Kuroda, 1932: 93; Lamy, 1935: 4; Kira, 1967: 136, pl. 49, fig. 6; Dijkstra, 1989: 12, 13, 14, illustr.; 1990: 4, 5, illustr.

Chlamys (Chlamys) quadrilirata.- Habe, 1951: 74; Azuma, 1960: 75.

Bractechlamys quadrilirata.- Habe, 1977: 83; Wang, 1983c: 531, 533, pl. 1, figs. 8-10.

Glorichlamys quadrilirata.- Dijkstra, 1991b: 45; 1993: 10, illustr.

Type material: Untraceable.

Type locality: Nagasaki, Japan.

Material examined: RED SEA: Elat, 20-25m, under rock, sand and rubble, 1 spm., HD 2879.

Distribution: Red Sea, Malagasy, Thailand, extending eastwards to southern Japan, China, Philippines, Indonesia, Australia, New Caledonia, and Fiji Islands. Littoral to sublittoral depths, living under rocks, coral boulders or among coral rubble on soft substrates.

Description: Shell small, up to ca. 25mm high, suborbicular to elongate, inequivalve, slightly inequilateral, both valves convex and radiated, inside plicated, auricles strongly unequal, umbonal angle ca. 85-90°, auricular crura well developed, resilium triangularly oblong.

Left valve sculptured with 8-11 prominent quadripartite (in mature individuals) rounded radial costae and 1-3 interstitial radial riblets. Microsculpture with closely arranged commarginal lamellae. Anterior auricle with 10-12 weakly and strongly developed radial riblets, lamellated and noduliferous on dorsal margin, posterior auricle very small with few fine radial riblets.

Right valve with broad prominent quadripartite radial costae, less rounded than of those of the left valve, one interstitial radial riblet per interval. Microsculpture as in left valve. Anterior auricle with ca. 10 squamose radial riblets. Byssal notch weak, byssal fasciole small, active ctenolium with 4-6 teeth on the suture.

Colour of left valve cream with purple or brown maculations, right valve paler or whitish.

Remarks: This is a new record for the Red Sea. Only one dead specimen has been collected so far, which is morphologically similar to the original description of Lischke. For conchological comparison with *Glorichlamys elegantissima* see Dijkstra (1989: 12-15).

Genus *Gloripallium* Iredale, 1939

Gloripallium Iredale, 1939: 357.

Type species (by original designation): *Ostrea pallium* Linnaeus, 1758; Recent, "O. Australiore et Indico" [restricted to Ambon, Maluku, Indonesia by Dijkstra (in press)].

Diagnosis: Free-swimming Decatopectinini, suborbicular to elongate, solid, slightly equiconvex, equilateral to somewhat oblique, with 7-15 regularly developed primary radial plicae, secondary radial riblets, commarginal lamellae, antimarginal microsculpture in early growth-stage, no shagreen microsculpture, auricles unequal, byssal notch moderately deep, byssal fasciole rather small, ctenolium well developed.

Distribution: Miocene-Recent (Hayami, 1989: 15); Indo-West Pacific; littoral to sublittoral depths.

Remarks: Hertlein (1969: N357) treated *Gloripallium* as a synonym of *Cryptopecten* Dall, Bartsch & Rehder, 1938. Waller (1986: 40) and subsequently Vaught (1989: 119) interpreted *Gloripallium* as an extant genus in Decatopectinini.

Gloripallium maculosum (Forsskal, 1775) (Plate 6, fig. 28)

**Ostrea maculosa* Forsskal, 1775: 26, no. 59; 123, no. 59 [Original diagnosis].

'*Pallium variegatum et aculeatum*' Chemnitz, 1784: 305, pl. 64 fig. 608 [invalid publication].

Ostrea sanguinolenta Gmelin, 1791: 3322, no. 41.

-*Pecten pictus* Deshayes in Laborde & Linant, 1830: 66, figs. 1, 2.

**Pecten concinnus* Reeve, 1853: spec. 167, pl. 35, fig. 167.

-*Pecten luxurians* Küster in Küster & Kobelt, 1859: 111, no. 70, pl. 32, fig. 1.

Ostrea sanguinolenta.- Dillwyn, 1817: 253, no. 15; Wood, 1825: 49, no. 16.

----- Savigny, 1817: pl. 13, fig. 8.

Pecten sanguinolentus.- Bosc, 1824: 262; G.B. Sowerby 2nd, 1842: 73, no. 86, pl. 13, fig. 59; Hanley, 1843: 283; Catlow & Reeve, 1845: 83, no. 83; Reeve, 1853: sp. 98, pl. 24, fig. 89 [sic] [fig. 98]; Reeve, 1860: 58, no. 127; Vaillant, 1865: 112, no. 39; Issel, 1869: 102, 372; Macandrew, 1870: 449; P. Fischer, 1870: 168; Cooke, 1886: 134; Küster & Kobelt, 1888: 40, no. 9, pl. 11, fig. 2; Paetel, 1890: 233; Smith, 1891: 390; Shopland, 1896: 234; 1902: 171.

Pecten ----- Audouin, 1828: 208, pl. 13, fig. 8.

Pecten concinnus.- Issel, 1869: 103; Macandrew, 1870: 449; Martens in Möbius, 1880: 314; Cooke, 1886: 134; Paetel, 1890: 229.

- Pecten luxurians*.- Paetel, 1890: 231.
Chlamys sanguinolenta.- Pallary, 1926: 122, pl. 17, fig. 8; Lamy, 1928: 169; 1938: 12 [in part]; Cox, 1929: 206, no. 7; Pallary, 1932: 317; Moazza, 1939: 31; Dance, 1974: 234, illustr.; Mastaller, 1978: 138; 1979: 141.
Pecten pictus.- Tomlin & Salisbury, 1928: 33.
Chlamys concinna.- Cox, 1929: 204.
Chlamys luxurians.- Cox, 1929: 205.
Chlamys picta.- Cox, 1929: 205.
Manupecten sanguinolentus.- Lamy, 1935: 312; Franc, 1956: 54.
Chlamys (Pallium) sanguinolenta.- Moazzo, 1939: 31.
Chlamys (Aequipecten) sanguinolenta.- Eames & Cox, 1956: 44.
Excellichlamys concinna.- Waller, 1972: 248, 250, figs. 107-110.
Aequipecten sanguinolentus.- Selli, 1973: 183. [references]
Chlamys sanguinolenta.- Dance, 1974: 234, illustr.; Mastaller, 1987: 210.
Cryptopecten sanguinolentus.- Oliver, 1982: 11.
Excellichlamys sanguinolenta.- Abbott & Dance, 1982: 308, illustr.
Gloripallium sanguinolentum.- Sharabati, 1984: pl. 44, figs. 9, 9a-c; Rombouts, 1991: 43, pl. 15, figs. 5, 5a.
Ostrea maculosa.- Yaron, Schiøtte and Wium-Andersen, 1986: 181, figs. 21, 22.
Chlamys (Cryptopecten) maculosa.- Oliver, 1992: 72, 76, pl. 14, fig. 2, text-figs. 23a-b.

Type material: *Ostrea maculosa* Forsskal: Lectotype designated and figured by Yaron, Schiøtte & Wium-Andersen (1986: 181, fig. 22) ZMUC BIV-29, 2 paralectotypes (lv + rv) ZMUC BIV-306; *Ostrea sanguinolenta* Gmelin: Junior objective synonym of *O. maculosa*; *Pecten pictus* Deshayes in Laborde & Linant: Type material untraceable; *Pecten concinnus* Reeve: 2 syntypes BMNH 40.4.6.52.1-2; *Pecten luxurians* Küster: Type material untraceable [pers. comm. Dr. R. Zilch].

Type localities: = *Ostrea maculosa* : Red Sea, Gulf of Suez, Suez; *Ostrea sanguinolenta*: "mari rubro" [Red Sea]; *Pecten pictus*: Red Sea; *Pecten concinnus*: Red Sea; *Pecten luxurians*: Red Sea.

Material examined: The type material. RED SEA: Elat, 1 spm., HUI 35733; Elat, 2 v, HUI 35734; Elat, 7 v, HUI 35736; Elat, 4-6m, amongst coral, live, 1 spm., HD 439; Elat, 4-10m, amongst coral, live, 5 spms. (juv.), HD 1516; Elat, 9-12m, under coral, 1 spm., HD 2627; Elat, 8-9m, outside of reef, on coral, live, 1 spm., HD 2629; Aqaba, 1 spm., HUI 35735; 30km S of Elat, 6-10m, amongst coral, live, 1 spm., HD 914 [figured in Rombouts (1991: pl. 15 fig. 5)]; Nabeck, 4-6m, amongst coral, live, 3 spms. (juv.), HD 1353; Elat, 5 spms., 1 v, 1964/65, leg. M. Blom, ZMUC; Ras Burqa, beach, 1 spm., 6.X.1968, NS 4481; Ras Burqa, beach, 1 spm., 6.X.1968, NS 4483; Ras Burqa, 8-10m, 1 v, HUI 35651. GULF OF ADEN: Djibouti, Tadjourah Gulf, 20m, sand and coral rubble, live and dead, 2 spms. + 3 v, HD 3691.

Distribution: Red Sea and Gulf of Aden. Littoral to sublittoral depths, living amongst coral and coral rubble on sandy substrates.

Remarks: All authors overlooked Forsskal's description of *O. maculosa* from the Red Sea, prior to Yaron *et al.* (1986), and mostly used Gmelin's name *O. sanguinolenta*; Gmelin only cited Chemnitz (1784). Chemnitz also overlooked Forsskal's publication, but mentioned Forsskal and Niebuhr's expedition to the Red Sea in his description: "*Sie ist von der gelehrten Gesellschaft, welche unser höchstseliger König nach Arabien gesandt, hierher geschicket worden.*" [The species is from the scientific expedition, which was sent to Arabia by our honourable king]. Thus Gmelin indirectly referred to the material described by Forsskal (1775).

P. pictus Deshayes in Laborde & Linant is preoccupied by Da Costa (1778: 144) and the type material is morphologically similar to *O. maculosa*.

P. concinnus Reeve is preoccupied by Koch & Dunker (1837: 42) [not Philippi, 1845] and the type material is identical to young specimens of *O. maculosa*.

P. luxurians Küster is also similar to *O. maculosa* and Küster also mentioned in the original description the close alliance of *O. sanguinolenta*. Cox (1929: 205) treated *P. luxurians* as a variation of *O. sanguinolenta*.

For description of the present species see Oliver (1992: 76).

Gloripallium pallium (Linnaeus, 1758)

(Plate 10, figs. 48-49)

**Ostrea pallium* Linnaeus, 1758: 697, no. 163.

-*Pecten novaeguineae* Tenison Woods, 1878: 267.

Pecten pallium.- Lamarck, 1819: 170; Reeve, 1853: spec. 63, pl. 17, figs. 63a-c; Küster & Kobelt, 1888: 39, 103, pl. 11, figs. 1, 5, pl. 28, figs. 7-8, pl. 29, fig. 1.

Pecten (Aequipecten) pallium.- Dautzenberg & Bavay, 1912: 19; Adam & Leloup, 1939: 59.

Gloripallium pallium.- Iredale, 1939: 357; Kira, 1972: 140, pl. 50, fig. 10; Waller, 1972: 239, pl. 3, figs. 45-47 [description, ecology, distribution]; Dijkstra, 1984c: 17, illustr.; 1991b: 46; 1997: 316, 328, figs. 28-32; Mastaller, 1979: 140; 1987: 210; Rombouts, 1991: 42, pl. 15, figs. 4, 4a.

Chlamys (Cryptopecten) pallium.- Hertlein, 1969: N357, fig. C79: 1c.

Type material: *Ostrea pallium* Linnaeus: Lectotype (H 42 mm, L 41mm) LSL [not registered] designated by Dijkstra [in press], 3 paralectotypes LSL, 2 possible paralectotypes UUZM [not registered]; *Pecten novaeguineae* Tenison Woods: Holotype not traced in Tasmanian Museum and Art Gallery at Hobart [Kemp, pers. comm.].

Type localities: *Ostrea pallium*: "O. australiore and Indico". More restricted by Dijkstra [in press] to the Moluccas [Maluku], Indonesia; *Pecten novaeguineae*: Pleistocene, Hall Sound, Papua New Guinea.

Material examined: The type material. RED SEA: Elat, 2-4m, among coral rubble, live, 1 spm., HD 178; Elat, 4-6m, among coral rubble, 1 spm., HD 400; Assab, 2-4m, among coral rubble, live, 2 spms., HD 172; SOMALIA: off Mogadiscio, 15-20m, soft substrates, live, 1 spm., HD 2966; off Mogadiscio, 20-25m, amongst rubble, sand, live, 1 spm., HD 6483.

Distribution: Red Sea, Gulf of Aden, east coast of Africa to South Africa, Malagasy, Réunion, Mauritius, Arabian Sea, extending eastwards to southern Japan to the central Pacific; not living in the Hawaiian Islands. Intertidal to littoral depths, living byssally attached to rocks, stones, corals or amongst coral rubble on soft substrates.

Remarks: Although *G. pallium* is a very common pectinid species with a wide distribution in the Indo-Pacific, it seems to be rare in the Red Sea. This is the first record of living specimens from that region. Material examined is morphologically similar to the type specimens.

For description of the present species see Waller (1972: 239).

Genus *Juxtamusium* Iredale, 1939

Juxtamusium Iredale, 1939: 368.

Type species (by original designation): *Juxtamusium oblectatum* Iredale, 1939 [junior synonym of *Pecten (Chlamys) coudeini* Bavay, 1903].

Diagnosis: Free-living Decatopectinini, thin, compressed, suborbicular, equilateral, auricles unequal, with numerous irregularly to more regularly spaced radial riblets with microscopic overrunning commarginal lamellae, hinge plate flat, lacking prominent crura, grooves or denticles, resilial insertion fold on anterior auricle only, resilifer obliquely oblong, byssal fasciole narrow, byssal notch shallow, ctenolium present on suture of both valves.

Distribution: Pliocene - Recent (Waller, 1972: 253); Indo-West Pacific; littoral to sublittoral depths.

Remarks: Hertlein (1969: N357) treated *Juxtamusium* as a subgenus of *Chlamys* in the suprageneric group of *Chlamys*. Waller (1986: 40) and subsequently Vaught (1989: 119) considered *Juxtamusium* to be an extant genus of Decatopectinini.

Juxtamusium is the only known genus of pectinids with a ctenolium on the left valve as well as the right (Waller, 1984: 211).

Juxtamusium maldivense (Smith, 1903)

(Plate 5, fig. 22)

**Pecten maldivensis* Smith, 1903: 622, pl. 36, figs. 19-20.

Pecten maldivensis.- Melvill & Standen, 1907: 809; Melvill, 1909: 126; Dautzenberg & Bavay, 1912: 17; Iredale, 1939: 368.

Chlamys maldivensis.- Lamy, 1935: 311; Viader, 1937: 61; Oliver, 1982: 10.

Juxtamusium maldivense.- Waller, 1972: 224, 226F, 227, 250-254, 251F, 252T, 258, 259, pl. 7, figs. 111-127, pl. 8, fig. 134; Thayer, 1975: 447-449, 3 figs.; Abbott & Dance, 1982: 315, illustr.; Dijkstra, 1984b: 8, illustr.; Sharabati, 1984: pl. 44, figs. 4-4a; Waller, 1984: 211.

Chlamys (Juxtamusium) maldivensis.- Oliver, 1992: 71, 76, pl. 12, figs. 5a-b, text-figs. 10a-b.

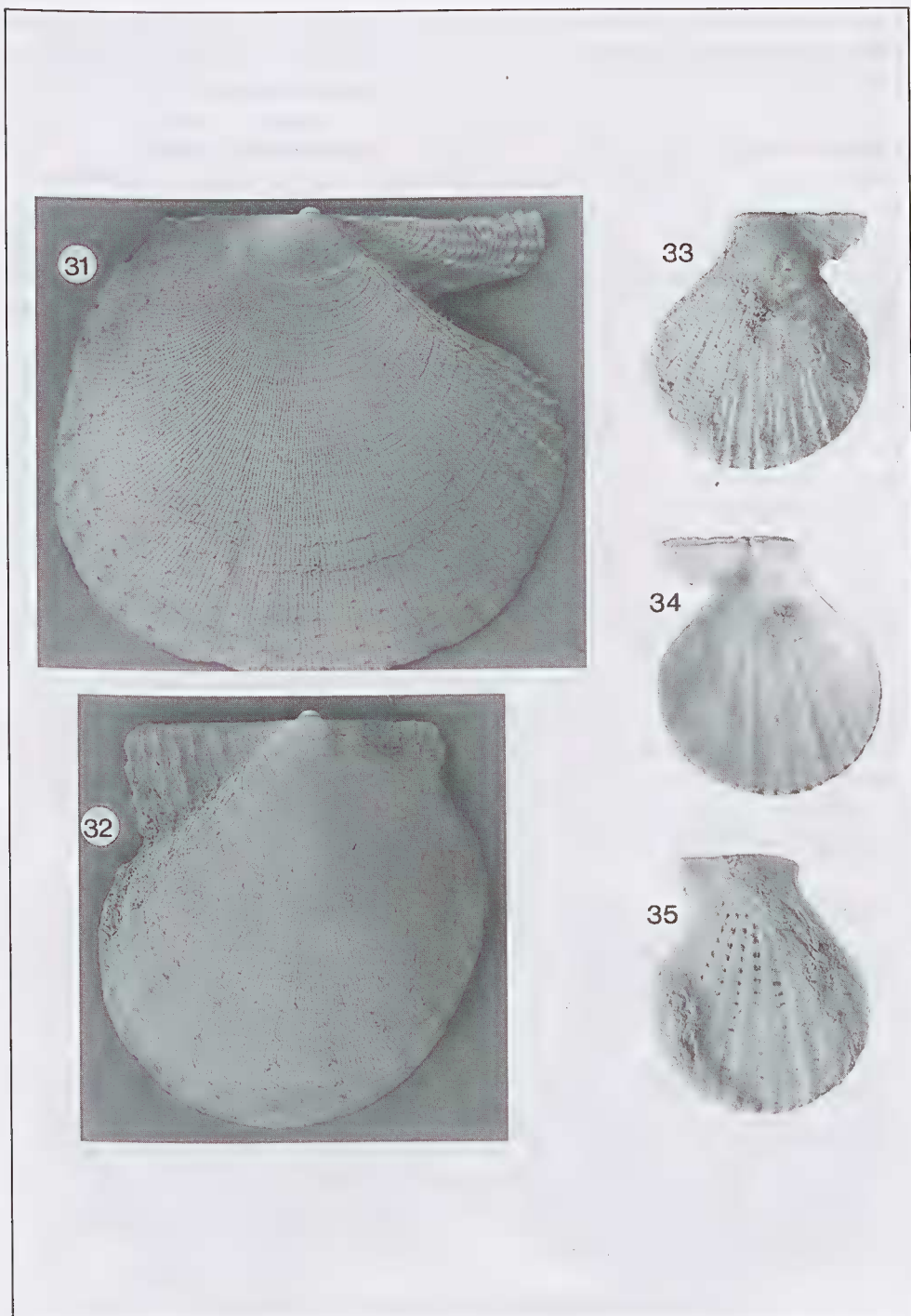


Plate 7.

Figures 31-32. *Delectopecten musorstomi* Poutiers, 1981. 31. TAU-MO 28555, Elat, opp. Old Port, 121m, H 4.7mm, rv, exterior. 32. TAU-MO 28556, Elat, opp. Oil Port, 344m, H 4.0mm, lv, exterior. 33-35. *Laevichlamys rubromaculata* (G.B. Sowerby 2nd, 1842). ZMUC, Elat, H 29.9mm, spm. 33. rv, exterior. 34. rv, interior. 35. lv, interior.

Type material: Lectotype [second largest specimen] designated and refigured by Waller (1972: 250, figs. 111-112) BMNH 1903.9.17.49, 4 paralectotypes BMNH 1903.9.17.50-53. Largest specimen measured by Smith, was not figured by him.

Type locality: Indian Ocean, Maldive Islands, 1-44 fathoms [= 2-80m].

Material examined: RED SEA: off Elat, 40-50m, 1 v, 5.ix.1966, MO 28559; off Elat, 40-50m, 29 v, 5.ix.1966, MO 28581; off Elat, 60-90m, 1 v, 5.ix.1966, MO 28562; off Elat, 40-50m, 2 v, 6.ix.1966, MO 28558; off Elat, 60m, 13 v, 6.ix.1966, MO 28560; off Elat, 40-50m, 21 v, 6.ix.1966, MO 28568; off Elat, 60-80m, 10 v, 7.ix.1966, MO 28564; off Elat, 62-80m, 15 v, 7.ix.1966, MO 28569; off Ras Taba, 55-90m, 1 v (fragment), 14.xii.1967, MO 28576; El Hamira Bay, 15m, 1 v, 14.xii.1967, MO 28566; El Hamira Bay, 47m, 3 v, 14.xii.1967, MO 28570; El Hamira Bay, 24m, 3 v, 14.xii.1967, MO 28567; El Hamira Bay, 24m, 2 v (juv.), 14.xii.1967, MO 28571; off Gesirat Farun, 50m, 3 v, 21.viii.1968, MO 28563; off Gesirat Farun, 50m, 4 v, 21.viii.1968, MO 28573; Elat, opposite Old Port, 121m, 1 v, 10.ix.1968, MO 28575; off Mersat Abu Samra, 46-49m, 12 v, 6.x.1969, MO 28561; off Mersat Abu Samra, 49-55m, 7 v, 6.x.1969, MO 28565; off Mersat Abu Samra, 60m, 3 v, 6.x.1969, MO 28572; off Mersat Abu Samra, 51-53m, 6 v, 6.x.1969, MO 28574; off Wadi Murach, 73-82m, 7 spms., 9.x.1969, NS 16 470; Elat, intertidal, 2 v, xii.1970, NS 7075; Elat, 1 spm., HUI 35587; Elat, harbour, 1 spm., HUI 35589; Gulf of Aqaba, 1 v, HUI 35592; Elat, harbour, 2 v, HUI 35606; off Elat, 6-10m, under rocks, live, 2 spms., HD 1581; off Elat, 12-14m, on coral, sand, live, 1 spm., HD 2695; off Elat, 8-10m, amongst coral, live, 1 spm., HD 2700 [figured in Rombouts (1991: pl. 26 fig. 7)]; off Elat, 9m, under dead coral, sand, live, 2 spms., HD 2701; off Elat, 6-8m, amongst coral rubble, sand, 1 spm., HD 2702.

Distribution: Red Sea, east coast of Africa to South Africa, Arabian Sea, eastwards to southern Japan, Philippines, Indonesia, and New Caledonia. Littoral to sublittoral depths, living byssally attached to corals and coral rubble on sandy substrates.

Remarks: Specimens from the Red Sea have more prominent sculpture on both valves than those of the type material. *J. coudeini* is closely related, and differs from *J. maldivense* in having a smoother surface with regularly spaced undulating radial costae. Both species are variable in sculpture.

For description and more information on infraspecific variation, functional morphology and ecology see Waller (1972: 252-253).

Genus *Mirapecten* Dall, Bartsch & Rehder, 1938

Mirapecten Dall, Bartsch & Rehder, 1938: 84.

Type species (by original designation): *Mirapecten thaanumi* Dall, Bartsch & Rehder, 1938 [junior synonym of *Pecten mirificus* Reeve, 1853]; Recent, Hawaiian Islands.

Diagnosis: Free-living Decatopectinini, compressed; right valve slightly more convex than left valve, orbicular to suborbicular, inequivalve, inequilateral to equilateral; auricles unequal, microsculpture of closely spaced commarginal lamellae; regularly arranged primary squamous lirae (5-7) to irregularly arranged primary and secondary lirae (7-11), usually squamous, sometimes noduliferous or smooth; byssal notch moderately deep, byssal fasciole rather small, ctenolium well developed.

Distribution: Miocene - Recent (Hayami, 1989: 16); tropical Indo-Pacific; littoral to sublittoral depths.

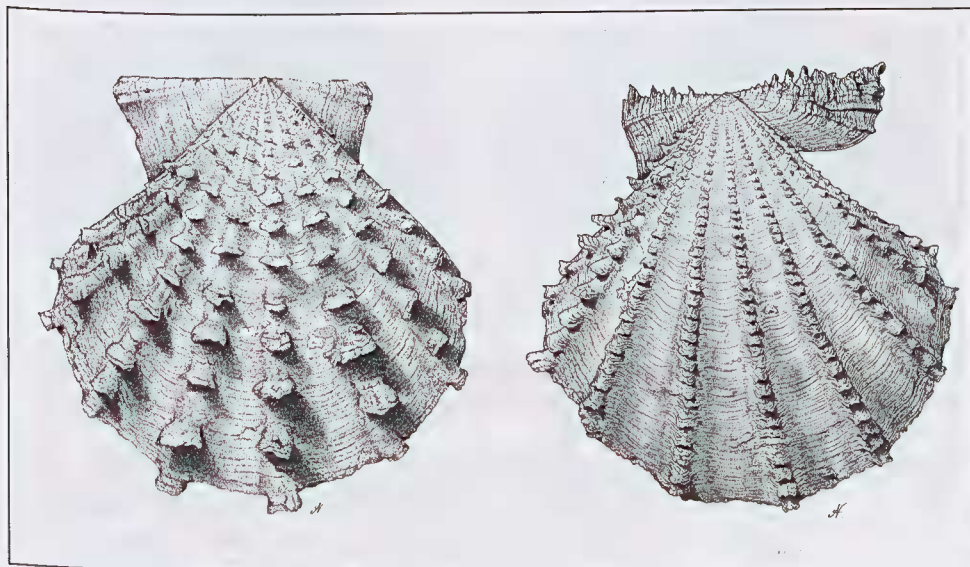
Remarks: Hertlein (1969: N 366) treated *Mirapecten* as a subgenus of *Semipallium* [Jousseume] Lamy, 1928 and placed it in the suprageneric group of *Decatopecten*. Waller (1986: 40) and Vaught (1989: 119) considered *Mirapecten* to be an extant genus in the tribe Decatopectinini.

Mirapecten yaroni sp. nov.

(Plate 8, figs. 36-39, text-figs. A-B)

Mirapecten rastellum (Lamarck).- Sharabati, 1984: pl. 44, figs. 1, 1a-g [not *Pecten rastellum* Lamarck, 1819].

Description: Shell medium of size to approximately 70mm, convex, inequivalve, subequilateral, orbicular (immature) to slightly elongate (mature), auricles unequal in size, umbonal angle ca. 90°.



Text-figures.

Figures A-B. *Mirapecten yaroni* n. sp. Holotype, ZMUC-BIV 323, Elat, spm. A, lv, exterior. B, rv, exterior.

Left valve sculptured with 6 regularly arranged radial plicae bearing widely spaced, prominent scales, and a small radial rib near the anterior and posterior margins, interstices with microscopic close-set commarginal lamellae, inconspicuous in early growth stages and more prominent in late growth stages near ventral margin, also produced on plicae. Auricles also with microscopic close-set commarginal lamellae and weak radial riblets (one on anterior, 4 on posterior), on antero- and postero-dorsal margins strongly developed scales.

Right valve with 5 regularly arranged radial plicae with weaker and more closely arranged scales than on left valve, two radial riblets on each side, interstices broader than lirae, interstitial microsculpture similar to that on left valve. Auricles with similar commarginal microsculpture to that on left valve, with 4 radial ribs on anterior, 2 on posterior auricle (much weaker), strongly developed scales on antero- and postero-dorsal margins.

Hinge line straight, byssal fasciole broad, byssal gape rather shallow, active ctenolium with 6 teeth, auricular crura well developed, resilium triangular elongate, weak auricular ridges near anterior and posterior margins. Inner surface plicated with small radial ridges.

Colour pale red with dark red maculations on left valve, much paler on right valve, exterior pigmentation translucent, interior red near ligament and ventral margin, yellowish near auricular margins.

Type material: Holotype (H 43.8mm, L 44.3mm, D 12.0mm) ZMUC BIV-323, 45 paratypes (34 HD, 6 HUJ, 1 NS, 1 ZMTAU, 3 ZMUC).

RED SEA: Elat, opposite Old Port, 121 m, 1 v (paratype), 10.ix.1968, MO 28536; Tiran, 68m, 1 spm. (juv.) (paratype), 17.x.1969, NS 16 473; Elat, 3 spms. (paratypes), 1964/65, leg. M. Blom, ZMUC; Elat, 3 v (paratypes), HUJ 35744; Aqaba, 3 v, HUJ 35743; off Elat, 10m, amongst dead coral, live, 1 spm. (paratype), HD 180; off Elat, 6-10m, amongst corals, sand, live, 3 spms. (paratypes), HD 427; off Elat, 6-10m, attached to corals, live, 3 spms. (paratypes), HD 915; off Elat, 4-15m, attached to corals, sand, live, 5 spms. (paratypes), HD 1583 [figured in Rombouts (1991: pl. 12 fig. 4b)]; off Elat, 6-10m, amongst coral rubble, sand, live, 3 juvenile spms. (paratypes), HD 2857; off Elat, 6-12m, among corals, live, 9 spms. (paratypes), HD 3690; Elat, 2-5m, amongst coral rubble on sand, 10 spms. (paratypes), HD 6745.

Type locality: Israel, Gulf of Aqaba, Elat.

Distribution: Red Sea. Littoral to sublittoral depths, living on the underside of coral boulders or amongst coral rubble on sandy bottoms.

Discussion: *Mirapekten yaroni* is morphologically closely similar to the Indo-West Pacific species *Mirapekten rastellum* (Lamarck, 1819) (Dijkstra, 1994: 474). *M. yaroni* grows larger (up to ca. 70mm high, *M. rastellum* ca. 45mm). The regularly arranged radial lirae of both species are identical, although the sculpture on the lirae is different. Strongly developed lamellae are produced in mature specimens of *M. yaroni*, these are nearly absent or weakly spinose on *M. rastellum*. Radial riblets present on the auricles of *M. yaroni* are absent on *M.*

rastellum. The colour of the present species is darker with red and brown spots, whereas *M. rastellum* is paler with more cream colouration. The bathymetric range of both species is also different: *M. yaroni* lives in shallow waters, whereas *M. rastellum* lives in deeper waters.

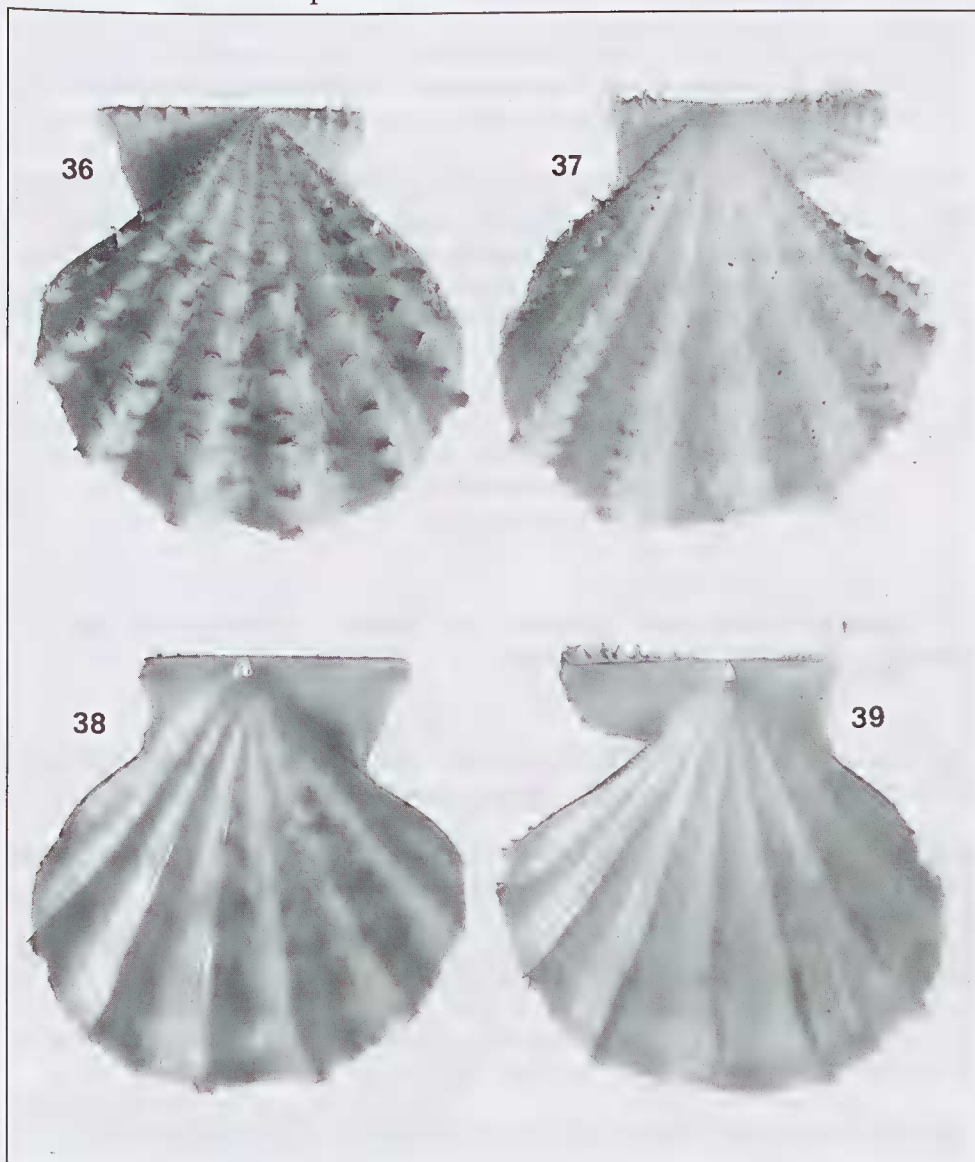


Plate 8.

Figures 36-39. *Mirapecten yaroni* n. sp. Holotype, ZMUC-BIV 323, Elat, H 43.8mm, spm. 36. lv, exterior. 37. rv, exterior. 38. lv, interior. 39. rv, interior.

Mirapecten moluccensis Dijkstra, 1988, also known from the Indo-West Pacific, differs from *M. yaroni* in its nodulose lirae, more numerous radial riblets on the auricles, and in colour (whitish, with black and reddish linear spots on the left valve).

Mirapecten mirificus (Reeve, 1853), also known from the Indo-West Pacific with a distribution similar to that of *M. rastellum* and a wider distribution than *M. moluccensis*, is strongly inequivalve and inequilateral, with a nearly flat left valve and irregularly developed radial lirae.

Etymology: This species is dedicated to the late Dr. Isaac Yaron (1934-1985), who for many years studied the Red Sea molluscan fauna, and tragically lost his life on April 11th 1985 while diving in the the Gulf of Aqaba.

Remarks: Oliver (1992: 77, pl. 12, figs. 6a-b) erroneously described and figured specimens he called *M. rastellum* from the Gulf of Suez and Jeddah, Red Sea. These are in fact an undescribed *Mirapecten* species. This species will be discussed elsewhere by Dijkstra & Kilburn [in prep.].

Cahill (1979: 36, fig. 6) and Dijkstra (1994: 475) mentioned a new subspecies of *M. rastellum* from the Red Sea, herein described as *M. yaroni*. For other remarks on *Mirapecten* species, see in Dijkstra (1988a, 1991a, 1991b, 1994).

Subfamily PECTININAE Wilkes, 1810

Tribe PECTININI Wilkes, 1810

Genus *Pecten* Müller, 1776

Pecten Müller, 1776: 31, 248.

Type species (subsequent designation by Schmidt, 1818): *Ostrea maxima* Linnaeus, 1758; Recent, eastern Atlantic.

Synonyms:

Deperetia von Teppner, 1922: 87, 259. Type species (by original designation): *Pecten cristatocostatus* Sacco, 1897; Miocene, Turin, Italy.

Heritschia von Teppner, 1922: 87, 264. Type species (by original designation): *Pecten aduncus* von Eichwald, 1830; Miocene, NW Ukraine.

Jaworskia von Teppner, 1922: 87, 266. Type species (by original designation): *Pecten grandis* J. de C. Sowerby, 1828; Pliocene, Suffolk Crag, England.

Notovola Finlay, 1926: 451. Type species (by original designation): *Pecten novaezelandiae* Reeve, 1852; Recent, New Zealand.

Diagnosis: Free-living Pectinini; shell solid, orbicular to suborbicular, left valve concave to flat, right valve strongly convex, strongly inequivalve, equilateral to subequilateral, auricles equal, with prominent angular to rounded radial ribs, sometimes bifid, microsculpture of closely spaced commarginal lamellae, sometimes absent, cardinal crura well developed, byssal sinus small, no active tenorium in adult.

Distribution: Miocene - Recent (Waller, 1991: 40); eastern Atlantic, Indo-West Pacific; subtidal to sublittoral depths.

Remarks: For further phylogenetic notes see Fleming (1957) and Waller (1991: 36).

Pecten erythraeensis G.B. Sowerby 2nd, 1842
(Plate 6, fig. 30)

**Pecten erythraeensis* G.B. Sowerby 2nd, 1842: 49, pl. 18, figs. 163-164.

Ostrea ziczac Linnaeus.- Forsskål, 1775: 32, no. 43 [not *Ostrea ziczac* Linnaeus, 1758].

Pecten maximus (Linnaeus) var.- Chemnitz, 1784: 272, pl. 60, figs. 586-587 [not binomial].

----- Savigny, 1817: pl. 13, fig. 9.

Pecten ----- Audouin, 1828: 208, pl. 13, fig. 9.

Pecten erythraeensis.- Catlow & Reeve, 1845: 80; Issel, 1869: 103; Macandrew, 1870: 449; Cooke, 1886: 135; Smith, 1891: 434; Tillier & Bavay, 1905: 178; Pallary, 1926: 122, pl. 17, figs. 9.1-4; Lamy, 1928: 219; 1935: 318; 1938: 13; Cox, 1929: 185, 203; Moazzo, 1939: 35; Ryland, 1951: 16; Barash & Danin, 1972: 361; Mastaller, 1979: 140; Oliver, 1982: 15; 1992: 70, 78, pl. 12, figs. 7a-b, text-fig. 8; Kilburn & Dijkstra, 1995: 271, 277.

Pecten medius Lamarck.- P. Fischer, 1865: 244; Vaillant, 1865: 111; Issel, 1869: 260; 373; Küster & Kobelt, 1888: 45, pl. 12, figs. 2-3 [not *Pecten medius* Lamarck, 1819].

Pecten ziczac.- Issel, 1869: 103 [not *Ostrea ziczac* Linnaeus, 1758].

Pecten (Vola) medius.- Issel, 1869: 104 [not *Pecten medius* Lamarck, 1819].

Vola erythraeensis.- Macandrew, 1870: 449; Paetel, 1890: 235.

Pecten filusus Reeve.- P. Fischer, 1870: 168.

Vola filosa.- Sturany, 1901: 36, 290, 295 [not *Pecten filusus* Reeve, 1852].

Pecten (Vola) filusus.- Melvill & Standen, 1907: 810 [not *Pecten filusus* Reeve, 1852].

Pecten (Euvola) erythraeensis.- Lamy, 1928: 219; 1938: 13; Barash & Danin, 1972: 361.

Chlamys erythraeensis.- Pallary, 1932: 317.

Pecten benedictus erythraeensis.- Fleming, 1957: 9, 13, 16-18, 33.

Pecten (Oppenheimopecten) erythraeensis.- Grau, 1959: 149; Rombouts, 1991: 54, pl. 20, fig. 3.

Type material: *Pecten erythraeensis* G.B. Sowerby 2nd: No specimens in the BMNH at London resemble Sowerby's figure or description closely enough to warrant consideration as type material (J. Pickering and K. Way, pers. comm.). The specimen (BMNH 1840.5.18.70) indicated by Fleming (1957: pl. 1, fig. 2) as holotype, is neither a type specimen or *P. erythraeensis*.

Type locality: Red Sea, in coral sand.

Material examined: The type material. RED SEA: Ras Matarma, 6 v, HUIJ 35598; off Elat, 40-49m, 1 v (fragment), 5.ix.1966, MO 28579; off Elat, 37-49m, 1 v (fragment), 6.ix.1966, MO 28535; Ras Sudr, beach, 3 v, viii.1971, MO 28578; off Ras Abu Rudeis, 29°04'N, 33°02'E, 42-46m, 1 spm., 11.xi.1972, NS 16 466; off Hurghada, 15-20m, live, on sand with eelgrass, 6 spms., HD 3693.

Distribution: Red Sea. Littoral depths, living on soft substrates (mud, sand, coral rubble).

Remarks: Forsskal (1775: 32) mentioned *Ostrea ziczac* from the Red Sea, and possibly referred to the Linnaean species, known only from the tropical western Atlantic. Chemnitz (1784: 281, fig. 592) also referred to a specimen of *O. ziczac* from the Red Sea, which was in the Spengler collection [ZMUC]. He also mentioned another species from the Red Sea, which was collected by Forsskal himself (p. 272, pl. 60, figs. 586-7, as a variation of *Pecten maximus* Linnaeus), which is similar to *P. erythraensis*. This would imply that there are two different *Pecten* species in the Red Sea. However, figure 592 confirms Chemnitz's figures 590-591, which refer to a species from Barbados (West Indies). Subsequently several authors (Dillwyn, 1817, G.B. Sowerby 2nd, 1842, Reeve, 1853, Issel, 1869 and Küster & Kobelt, 1888) cited Forsskal and Chemnitz, and also recorded the same erroneous locality of the Red Sea.

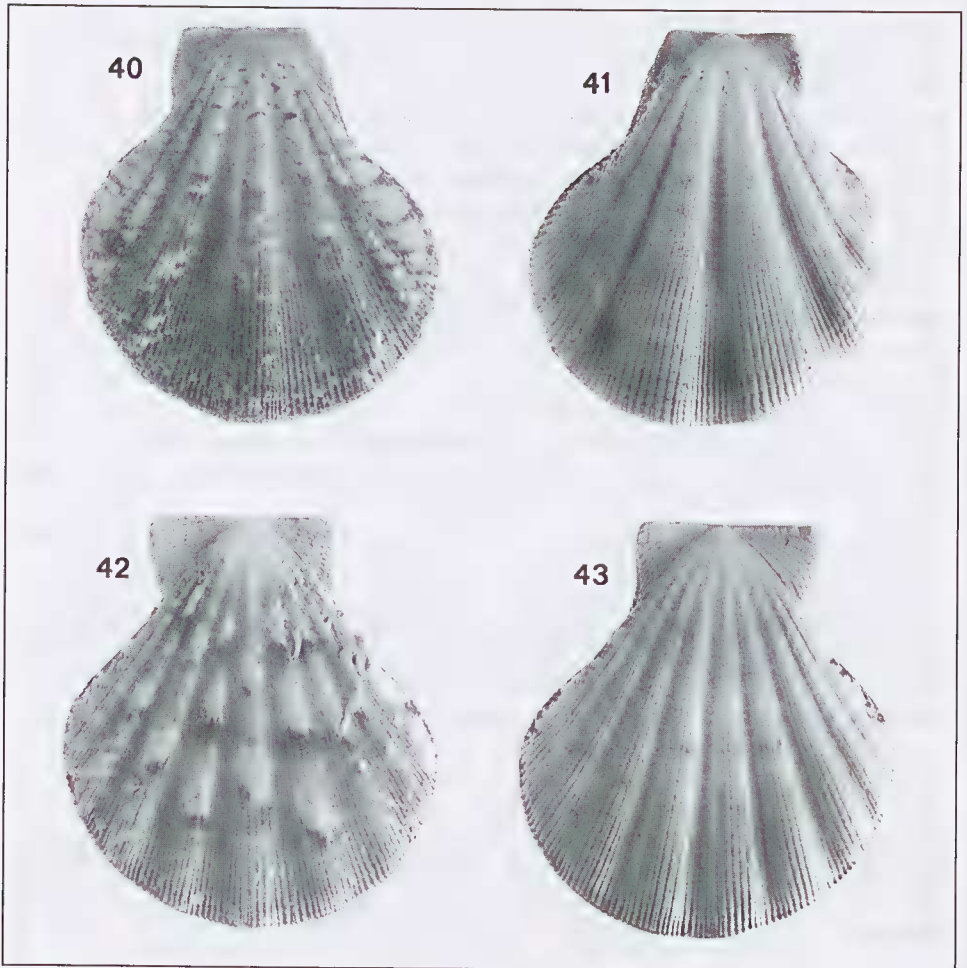


Plate 9.

Figures 40-41. *Decatopecten plica* (Linnaeus, 1758). HD 3327, off Hurghada, 20-40m, H 31.9mm, spm. **40.** lv, exterior. **41.** rv, exterior. **42-43.** *Decatopecten amiculum* (Philippi, 1851). HD 2103, Dahlak Archipelago, 9-12m, H 32.6mm, spm. **42.** lv, exterior. **43.** rv, exterior.

Vaillant (1865), Issel (1869) and Küster & Kobelt (1888), erroneously recorded *Pecten medius* Lamarck from the Red Sea. For further information see Cox (1929: 203).

Melvill & Standen (1907: 810) erroneously recorded from the Gulf of Oman *P. filusus* Reeve, which could be based on *P. erythraeensis* and also described a new species *Pecten dorotheae* from the Persian Gulf. This implies that *P. erythraeensis* has a wider distribution into the coastal waters of the Arabian Sea. However, material from that region has not yet been seen by these authors.

Bosch & Bosch (1982: 159) confused *P. erythraeensis* with typical *P. dorotheae* from Oman, which has angular costae on the right valve instead of rounded ribs, and interstitial commarginal lamellae, which are absent or almost absent in *P. erythraeensis*.

Barnard (1964: 422) recorded a closely allied South African species as *Pecten* cf. *erythraeensis*. Recently Kilburn & Dijkstra (1995) described this species as *Pecten afribenedictus*.

For description of the present species see Oliver (1992: 78).

Subfamily CHLAMYDINAE von Teppner, 1922

Tribe CHLAMYDINI von Teppner, 1922

Genus *Coralichlamys* Iredale, 1939

Coralichlamys Iredale, 1939: 355.

Type species (by original designation): *Coralichlamys acroporicola* Iredale, 1939 [junior synonym of *Pecten madreporarum* G.B. Sowerby 2nd, 1842]; Recent, tropical Indo-West Pacific.

Diagnosis: Byssally attached Chlamydini, lodged between branches of coral, regularly stenomorphic due to their habitat, with irregular squamose radial primary sculpture, commarginal lamellar secondary sculpture, sometimes with antimarginal striated microsculpture, shagreen microsculpture absent.

Distribution: Miocene - Recent (Hayami, 1989: 15). Tropical Indo-West Pacific. Littoral depths.

Remarks: Hertlein (1969: N355) and Vaught (1989: 118) placed *Coralichlamys* in the synonymy of *Chlamys* Röding, 1798. Waller (1993: 203) treated *Coralichlamys* as an extant genus of Chlamydini.

Coralichlamys madreporarum ([Petit] G.B. Sowerby 2nd, 1842)
(Plate 10, figs. 44-45)

**Pecten madreporarum* [Petit] G.B. Sowerby 2nd, 1842: 68, pl. 14, fig. 68.

**Coralichlamys acroporicola* Iredale, 1939: 356, pl. 5, figs. 26, 26a.

Pecten madreporarum.- Philippi, 1845: 203, pl. 2, figs. 4-5; Reeve, 1853: spec. 117, pl. 28, fig. 117; Küster & Kobelt, 1888: 131, pl. 36, fig. 6.

Pecten (Chlamys) madreporarum.- Adam & Leloup, 1939: 58, pl. 4, fig. 2.

Coralichlamys acroporicola.- Woolacott, 1955: 79, pl. 2, figs. 1-3.

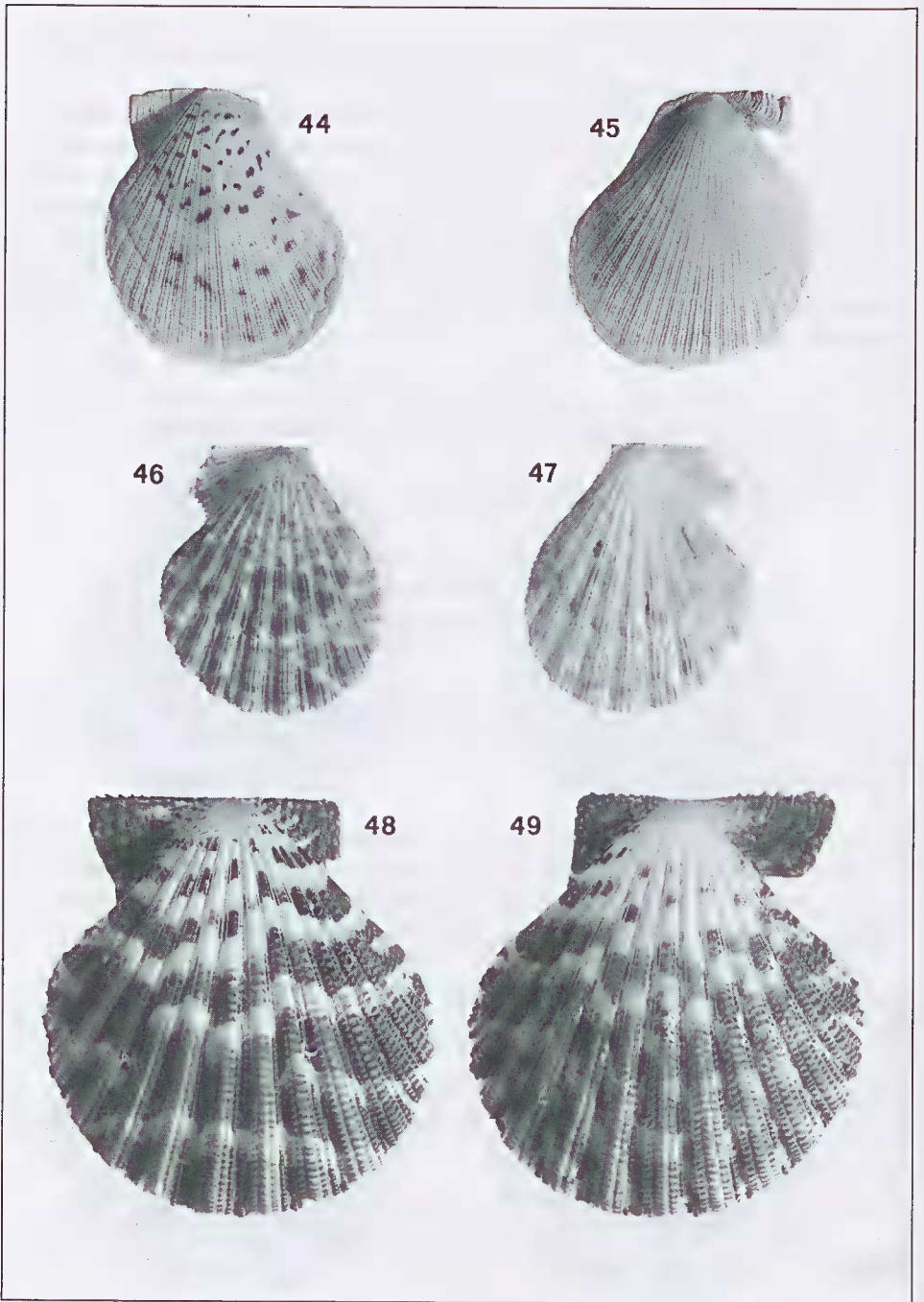


Plate 10.

Figures 44-45. *Coralichlamys madreporarum* (G.B. Sowerby 2nd, 1842). HD 3689, Djibouti, in situ *Acropora*, 18m, H 20.5mm, spm. 44. lv, exterior. 45. rv, exterior. **46-47.** *Glorichlamys quadrilirata* (Lischke, 1870). HD 2839, Elat, 20-25m, H 19.8mm, spm. 46. lv, exterior. 47. rv, exterior. **48-49.** *Gloripallium pallium* (Linnaeus, 1758). HD 178, off Assab, 2-4m, H 45.8mm, spm. 48. lv, exterior. 49. rv, exterior.

Chlamys madreporarum.- Waller, 1972: 238, pl. 3, fig. 42.

Chlamys (Coralichlamys) madreporarum.- Wang, 1983b: 47, pl. 1, fig. 11; Dijkstra, 1986b: 7, illustr. [references]; Rombouts, 1991: 23, pl. 24, fig. 10.

Coralichlamys madreporarum.- Dijkstra, Richer de Forges, Clavier & Lefort, 1990: 7, 8, illustr.

Type material: *Pecten madreporarum* G.B. Sowerby 2nd: Lectotype BMNH 1995083/1 herein designated, figured by Sowerby (1842: sp. 70, pl. 14, fig. 68), paralectotype BMNH 1995083/2, figured in Reeve (1853: sp. 117, pl. 28, fig. 117) paralectotype BMNH 1995083/3 (not figured); *Coralichlamys acroporicola* Iredale: Holotype AMS C90374.

Type localities: *P. madreporarum*: "Red Sea" (original description), "Java" (label); *Coralichlamys acroporicola*: Queensland, Low Isles, near Port Douglas.

Material examined: The type material. RED SEA: Elat, 4-8m, in *Acropora* branches, 1 spm., HD 2640. GULF OF ADEN: Djibouti, 18m, in *Acropora* branches, live, 2 spms., HD 1875.

Distribution: Red Sea, Gulf of Aden, Malagasy, Mauritius, Bay of Bengal, eastwards to the Philippines and New Caledonia. Subtidal to shallow sublittoral depths, a coral-dwelling species, lodged amongst *Acropora* branches.

Description: Shell small, up to ca. 30mm height, often stenomorphic or irregular, elongate, oblique, inequivalve, with right valve slightly more convex than left, inequilateral, with auricles unequal, umbonal angle ca. 80-90°.

Both valves sculptured with numerous, irregularly spaced, scabrous fasciated radial riblets. Near ventral margin ribs also have commarginal lamellar microsculpture, near posterior margin sometimes also having interstitial antimarginal microscopic striae. Auricles strongly unequal, anterior much larger in size, with fine radial riblets and commarginal lamellae, posterior with weaker sculpture and strongly dorsally declined.

Byssal notch deep, byssal fasciole rather broad, active ctenolium with 4-6 teeth on suture. Auricular crura broad, resilium strongly triangularly elongate and oblong.

Colour cream or whitish, left valve usually with fine brown maculations, right valve paler and usually without brown interrupted markings.

Remarks: This unique coral-dwelling pectinid could be easily confused with small white specimens of *Laevichlamys rubromaculata* from the northwestern Indian Ocean. However, its habitat (attached between coral branches) sculpture (much more irregular radial riblets) and microsculpture (commarginal lamellae) are different from the latter.

Genus *Laevichlamys* Waller, 1993

Laevichlamys Waller, 1993: 204.

